Industrial Finishing

Reg. U. S. Pat. Off.

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Contents of this Issue

From the Editor's Window 5

Feature Articles—

Do Paint Specifications Protect Buyers, by C. Dan Youngs 17
Modernistic Metalwork Design and Finish, by La Vera Ann Pohl.. 19
Why We Prefer Outside Spray Booths, by C. Stevens 22
Finishing Fabric for Airplanes, by H. H. Dyer, Jr. 26
Cleaning and Filling Wood Surfaces, by R. L. Kent 32
Decorative Stenciling, by M. V. Leach 36
Improved Finishing in Wood, by W. R. Beutin 40
Urushi Lacquer Finish, by F. S. Araki 44
Sandblasted Antique Oak Lacquer Finished, by E. T. Miller 50
Lacquer Finish Schedule for Railway Coaches, by J. C. Alsee 54
How to Avoid Muddy Blotchy Finishing, by E. B. Smethers 62
Fired Porcelain Finishes Produced in Custom Shop, by P. C. Bardin. 68

"Question and Answers" Section 81

"New Materials and Equipment" Section 87

New Metal Finishes 87
Universal Striper 87
Zeller Announces Outdoor Exposure Lacquer Grades 87
Permanent Penetrating Stains 91
Process For Degreasing Metals 92

Editorial 106

Short Articles

DuPont Decoration Service Submits Color Schemes 21
Naval Stores Lead Chemical Exports 21
Why Linseed Oil Caused Trouble 30
Cooper Hewitt Changed to General Electric Vapor Lamp Co 30
New Lacquer Book 34
Hercules Will Sell on Net Weight Basis 34
Buffer, Polisher Bulletin 38
Atlas Electric Device Co. Moves 38
Asbestos Drop Curtain Protects Spray Booth 42
Sand Correctly in the White 42
Color in Gas Appliances 48
Hercules Issues New Illustrated Booklet 48
Glue Causes Finish Trouble 60
Synthetic Condensation Resins in New Lacquers 64
Finishing Small Turnings by Joseph Cowan 79
Decorative Striping 86
Increased Production in Spraying Small Articles 105
Where Some Finish Troubles Originate, and Why 107

"Classified Advertising" Section 110

Advertisers' Index 111

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LET FACTS AND FIGURES SHOW ADVANTAGES

IF 1-Gray

From the Editor's Window

HAVE you ever noticed visitors at an art gallery—people moving along leisurely looking at the pictures? Suddenly a certain picture arrests their attention and almost stops them in their tracks. Perhaps several gather around to admire and comment upon this particular picture. Why does it stand out from the rest? Is it the subject? Most likely not; it's the treatment, the harmony of color, something perhaps of the artist's personality in it. It has what some critics call "color"; others, "personality."

Now is the time to put more of this inspiration and personality into every-day commercial work on industrial products. While some real beauty enters into numerous manufactured products today, there is also much evidence of something lacking in design, proportion, color harmony and neatness. Who has not seen decorations and finishes that seem to almost shout, "Take me off, I don't fit"— for example, a beautifully finished piece of furniture that has a ragged stripe in an unsuitable color.

Someone has said: "Never mind the neatness so long as it is attractive," But why not make it both neat and attractive—and give it a touch of individual personality too? The idea speaks for larger sales. With the widespread urge for training in art and the universal interest in and admiration for attractive effects in design, color, and decoration, it is vitally important for every manufacturer to study his products carefully with the idea of capitalizing upon this present-day demand. Ample facilities are available for producing the designs, color schemes, finishes and decorative effects that can put distinctive personality into every factory product.

H. H. Rohr

—Managing Editor

THE LAST THING YOU DO

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Do Paint Specifications Protect Buyers?

Practical finishing expert tells why some large buyers of finishing materials become committed to the policy of ordering according to specifications, and tells what it means to indulge in this practice

By C. Dan Youngs

WHAT MAY be termed the present "Era of Efficiency" is perhaps responsible for bringing into being a practice that has caused no little concern to both industrial users of finishes and to finish manufacturers.

During and immediately after the war, when industry was either inflated by the necessity of forced production or when reduced sales prices and overproduction resulted in the stern necessity for lower costs, the paint specification, heretofore confined to a few very large firms or to Governmental business, sprang into being.

Of course, there is much to be said on both sides of this question. Many finish manufacturers naturally dislike to make materials according to customers' specifications because they either change tried and tested formulas or, if strictly adhered to, bring forth the necessity of manufacturing "specials."

A concern buying finishes upon its own specifications is probably endeavoring to secure uniformity of materials, regardless of where the finishes are purchased. Such uniformity would be immensely valuable if it were attainable, but whether or not it is attainable is open to discussion. Let us look at this problem from both the viewpoint of the buyer and the finish manufacturer.

Perhaps the buyer has been, at times, the unfortunate recipient of materials that not only caused him loss but trouble. He may have been talked into purchasing them by some salesman who was sincere but unfamiliar with the requirements of each specific material. He sells what he thinks is right and the buyer accepts his word. Both are entirely honest in their deal but all they have discussed is the finished product.

Let us assume a corporation has bought on those lines and has been caused expense and trouble. What is the reaction? The buyer is sore at the salesman, believing the product was not up to his requirements; his next thought is a determination to buy elsewhere; to feel that he has been stung; to take his medicine and forget (or remember) it. But what if this happens, as it does, more than once or twice?

He is a business man and he must be qualified to go beyond the obvious and to delve into the factors that constitute his problem. It is evident that a study of the proposition will bring forth the apparent remedy at once. He will study the making of finishes; will formulate specifications which will give him the same product no matter from whom purchased. He will thus be independent of the various formulas that different

manufacturers have been using for his finishing materials. So he starts in.

A Problem in Chemistry

The first thing he discovers is that the making of finishes is a matter of both chemistry and of the physical properties of the raw materials going into the manufacture of finishes. Perhaps he already has a laboratory in his plant; if so, well and good. The problem can be turned over to the chemist in charge who is told to make up specifications for the various finishes used in the plant processes. What is the average result?

The chemist may be and perhaps is an expert in the problems connected with the plant functions, but to make up these specifications he must be either experienced in finish manufacture or must make a quick intensive study of such manufacture. Still, it is obvious that he cannot possibly assimilate the chemistry of paint products in a relatively short time, so as to be qualified to sit at the same table with the chemists employed by the finish manufacturer whose only problem is the study of finishes, and whose whole work is dependent upon such study.

Hence the buyer is checkmated at the start. He has one or two recourses. Either he must hire and retain upon his payroll the services of an experienced paint chemist, or he must look to the finish manufacturers for his specifications. By doing the first, he may spend more time and money than it is worth to offset the occasional trouble incurred by buying without specifications. If he takes the latter course, he is asking the finish manufacturer for trade secrets which have been gained through years of study and unlimited expense.

Naturally, the finish manufacturer is not going to antagonize an actual or a potential customer. He is going to give the matter thought and agree to furnish specifications. But the specifications he will furnish may be so vague and ambiguous that they will be of no value to any other organization.

Temperatures; Grinding

Everyone knows that any paint or finishing material can be analyzed so that the ingredients contained therein can be segregated, but no analysis will show the actual manufacturing processes—whether the vehicle was cooked at 150° F. or at 600° F.; whether the pigments were ground for 60 hours in a pebble mill, or whether they were run through a stone mill for four hours. These are operation details that belong only to the manufacturer, and he isn't likely to give them out. Rightly so. Why should he reveal the details of his own operations which he believes places him on a par with or superior to his competitors?

Really, I consider that when an actual or potential buyer requests specifications from a finish manufacturer, it is an exhibition of colossal nerve, for it is in effect a request to reveal trade secrets and operating methods to one's competitors. When a firm buys on specification, proposals are sent out to various manufacturers and the business is usually given to the lowest bidder. Naturally, the finish manufacturer must needs protect himself, and he must do so in a way that will not kill his potential market and business interests.

(Continued on page 96)

Fig. 1
vase

MODERNISTIC METALWORK DESIGN AND FINISH

Industrial Finishing's Specialist in colorful modern art and design, traveling in Europe, submits interesting notes, ideas, suggestions and sketches of the latest style furnishings, as observed in European capitols

By La Vera Ann Pohl

MODERNISTIC metal accessories. It is true that for some years we have had metal beds, metal dressers and even metal chairs, but metal furnishings still remain in the general minority. Perhaps this is due to some extent to lack of proper designing.

Designers of modernistic furniture and accessories in Europe are making a great effort to employ metal in every conceivable fashion in and on all articles produced. European exhibits show rooms completely equipped with metal furnishings—all excepting the floor covering—and in some cases it has not been astonishing to find copper floors and walls. Nor are these metal pieces merely confined to exhibits; they are already becoming part of the schemes of hotels and buildings of modern design.

Fig. 1—A lamp in background; flower vase at left; and bowl in foreground.

Referring to Fig. 1, which illustrates a lamp, a flower vase and a bowl, the lamp represents the very newest type of modern realization. Its base is aluminum or silver (could also be copper) highly polished or lacquered. The shade or transparent section is eggshell parchment, and the cover is the same material as the base.

This lamp could also be made of a heavy metal and lacquered in color or made to represent a metal such as silver or copper. The surface must be as smooth as glass, and as brilliant in luster as a piece of porcelain. Its inverted-cone shaped body gives it an unusual light area and lamp distinction. The light is made delicately soft in its reflection downward. The use of a simple eggshell shade without color or design emits a good light which has the suggestion of being indirect.

The copper vase with silver inlay, also in Fig. 1, is a beautiful piece in its simplicity. This is also lacquered in the dull finish. Where copper is employed the finish is preferably dull.

The fruit or nut bowl is of silver, copper or aluminum. One notes in these articles the trend of modern simplicity. The main thing observed is that of little or no decoration.

The articles grouped in Fig. 2 show the very decided influence of the straight line and full curve. It is perhaps interesting to note

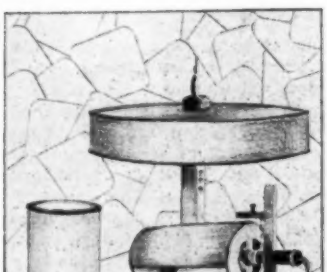


Fig. 2—A study in lamps—a wall bracket, table lamp and reading lamp

that the straight line is of German origin, while the full curve is Austrian. The use of pure white eggshell, screws and holes is traceable to France in Modern design.

These articles are from the fall exhibits. The main theme or trend is to keep in tune with the Mechanical Era. No. 1 is a wall bracket of pure metal effect, of extremely high luster in both shade and bracket. No. 2 is a table lamp representative of structural steel. No. 3 is a reading lamp, quite mechanical looking, yet very simple in construction and operation. Colored lacquered metal could be used in each lamp; however, each lamp would lose some of its rigid distinction.

The shades are eggshell without a design and without color—just a pure creamy white tone is relied upon to produce the best effects in lighting. There is a certain note of appeal in a lamp of this style. Eggshell shades are highly lacquered, not shellaced. Shellac turns them yellow but when lacquered they remain as white as an eggshell. The lacquer must be a brilliant gloss however, so as to reflect and cause reflections. The bases are surfaced and lacquered with a non-tarnish and non-blemish lacquer, which has become the popular treatment for metal. Perhaps the most interesting articles are illustrated in Fig. 3. A chair of aluminum and a table which acts as a

Fig. 3—A chair and combination bridge lamp

foot rest, table and bridge lamp all in one—also of metal. The aluminum chair is done in soft toned colored lacquer; the seat is soft and downy and the upholstery is a heavy linen or velour of contrasting color or deeper tone. One notes here again the tracery of international modernistic designing.

The table, lamp and foot stool combination is one of the season's newest attractions. The base is of copper or a heavy metal, left either "natural" or colored. From the base one finds the indicator for the balance of coloring; each new rise in plane is a lighter value of the same color, and when one reaches the shade one finds eggshell with a contrasting colored banding highly lacquered and polished surface.

If various metals are used, lighter colored metals are employed in the same development of schemes. The fall color schemes are much the same as listed in my previous articles, be it in wood or metal. The finish is lacquer—each season a lacquer more perfect. The workmanship in each piece has always the signs of a master at his craft and modernism goes through another season of brilliancy in ideas and conception. The Mechanical Era makes use of metal in design and material. It is the era in which metal has loomed upon the surface so extensively.

Du Pont Decoration Service Submits Color Schemes

A series of attractive color schemes for cafeterias, tea rooms and restaurants has recently been developed by the Du Pont Home Decoration Service. A color scheme for a cafeteria called the "White Sea Inn" carried out the marine atmosphere suggested by its name. It was finished in the following colors: Cream and ivory for walls and ceiling; Mandarin Red trimmed with black for tables, chairs and hat racks; blue, yellow and ivory for the decorations, and a scheme of Duco red and black for the serving counter, cigar and candy showcases.

For those who desire colorful tea rooms, a color scheme designed to give an atmosphere of warmth and charm was suggested as follows: Light buff and ivory on walls and ceiling, buff for the woodwork with the mouldings of the woodwork and the panels of the door emphasized by orange and brown; orange salt and pepper shakers on brown tables trimmed in orange; chairs finished in orange trimmed with brown; and buff counters with mouldings picked out in orange and brown.

A more conservative and perhaps richer atmosphere for the cafeteria is created by the following: Green tinted walls with ivory ceiling, woodwork and counters finished with interior gloss green, jade green table and chairs trimmed in rich red, with salt and pepper shakers of the same red.

A cheerful and inviting atmosphere for a tea room can be created with the following color scheme: Blue tint and ivory for the walls and ceiling, seafoam green woodwork and counters, Chinese yellow salt and pepper shakers on tables of nile green trimmed in Chinese yellow, and chairs of the same colors.

Naval Stores Lead Chemical Exports

Showing a steady gain in value, the naval stores exported from the U. S. lead all other classes of chemicals, according to a recent statement by J. E. Lockwood, director of sales, Naval Stores Division, Hercules Powder Co.

"Exports of naval stores (turpentine, rosin, pine oil) amount to $30,000,000 annually, contributing strongly to the favorable trade balance of this country," said Mr. Lockwood.

"Two-thirds of the world's supply of naval stores are produced in this country, and about half of this production is exported to all parts of the world. Next to the United States, France is the principal producer, furnishing about one-fifth of the world's supply."

Strong efforts are being made by manufacturers to increase the world consumption of naval stores. Mr. Lockwood maintains it is possible that a co-operative research program may be soon undertaken by American, or even world producers, to develop new uses and outlets for naval stores.

An International Naval Stores Conference is to be held at Jacksonville, Fla., in February, 1930, to promote co-operation in the industry.

"We still have some of the old type of exhaust tubes on the same side of the building. These are to be taken out as rapidly as possible and replaced with the new type of booths."—

C. Stevens
Works Manager.

Why We Prefer Outside Spray Booths

Works Manager of White Sewing Machine Corp., reviews what led up to the company's choice of outside booths for lacquer spraying and explains why the company prefers these booths

By C. Stevens

LACQUERS have become so widely popular that almost every finishing department is using them, either entirely or in part. Unfortunately, at the first adoption of lacquer, little thought was given to the fact that its use involved more or less of a fire hazard until experience (and in some cases a costly one) aroused users of this material to the point that to be successful with it, some vital changes had to be made.

In some departments it was found necessary to rebuild the equipment, while in others, management found it necessary to go further and change the location of the department, and even the personnel.

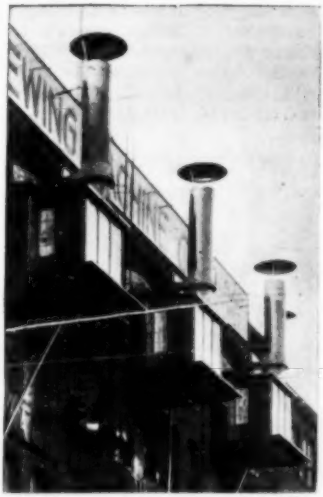
The first thing necessary—and this is not confined alone to lacquer—is to insist upon each and every workman being good housekeepers; untidiness and carelessness are two serious menaces in all institutions and they should not be tolerated.

The next item to consider, when using spray lacquer, is the booths—and it is this item that the present article deals with.

Everyone is acquainted with the old type of spray booth used in connection with varnish. All that was entirely necessary was a box type booth with a fan and proper spray equipment. A stack pushed straight out of a window or through the side of a wall seemed to answer the purpose as an exhaust outlet.

On days when the wind blew against these open stacks the operator got the full benefit of a heavy varnish odor, but no one really thought it was necessary to eliminate this, although in some cases the stacks were fitted with elbows and extended vertically to the top of the roof, thereby eliminating this trouble.

With the use of lacquer, these same booths were equipped with belt-driven fans and necessary changes in wiring to allow the fan motors to be out of the direct path of the fumes. The fan type exhaust was still used for some time, and although the blades were cleaned every day, by the following day they became so loaded with lacquer dust that their efficiency was greatly reduced, causing the fumes and dust to be left in the department. It was this



Looking upward at side of building from which three of the outside spray booths project.

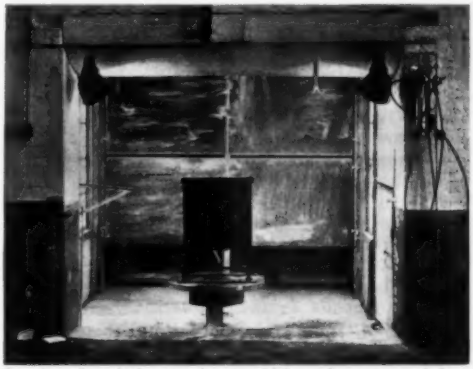
condition that prompted the adoption of the induced-air type of blower, which helped considerably.

The plant of White Sewing Machine Corporation was located in such a manner that the finishing departments could not be isolated, so other steps had to be taken to reduce the fire hazard to a minimum and remove the dangerous fumes from the operators. This led to the present installation in the Sewing Machine Division, making it one of the most modern and up-to-date finishing departments in the country to-day.

It is possible now to completely carry away all lacquer fumes, and at the same time the booths are isolated from the remainder of the factory in such a way that in case of fire very little damage is apt to occur. The booths are substantially attached to the outside wall by being mounted on two steel I-beams. These beams extend approximately 18-in. beyond the edge of the booth proper, leaving a small runway on three sides for painting, cleaning or making repairs. A railing should be attached to the edge of this platform for safety.

The I-beams pass through the brick wall and extend approximately 10-ft. into the room, resting against and being fastened to the joist, making them practically part of the building. The platform is of cypress covered with water-proofing material, the top then being covered with a galvanized steel plate.

The booth proper is double walled, the space between walls being filled with a special asbestos mixture to prevent any sweating



Interior of typical spray booth which projects outward from the outside wall

which would cause moisture to drop on the finished work. The remainder of the booth is rather general in design, having baffle plates at the rear and on each side. However, a small swinging window is built in to admit light; also an opening is provided to give access to the outside.

The blower is of the induced-air type, capable of producing 7,000-cu.ft. of air per minute. The stack is arranged free from obstruction, allowing all fumes to escape readily.

The air for these booths is allowed to enter the department on the opposite side through openings covered with fine screen, causing a constant changing of air throughout the entire department. With an air circulation of this type, the workman is able to operate the booth without getting the slightest odor of lacquer fumes.

Each booth is equipped with automatic sprinklers, three sprinkler heads being installed in each booth—one in the booth proper and two in the stack. These are arranged to be operated by a heat actuator acting on the sudden rise of heat, making it possible to flood the booth in less than five seconds. The baffle plate along the front edge is so arranged that the water hits it and forms a water curtain between the operator and the booth. In spraying, the operator stands inside the building, since it is not necessary for him to stand inside the booth.

In each booth there is built a small corner or pocket large enough to contain the pressure tank and a shelf for cleaning-solvent for the hands, spray guns or miscellaneous equipment used in spraying, thereby keeping the department free and clean.

An installation of this kind makes a very favorable impression on the employes in the department; it is not possible for refuse to accumulate around the booth. The front of the booth is in full view so everyone can see its state of cleanliness at all times.

Aside from manufacturing sewing machines, the White Sewing Machine Corporation also manufactures opera seating, church and school furniture—and the same type of booths are being installed in these divisions as rapidly as possible.

A close-up exterior side view of one of the outside spray booths

The New and Improved

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Zapon Sanding Sealer No. 2550 is not a substitute for shellac. It costs less, sprays easily, dries in ⅓ the time. Seals perfectly.

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THE most gratifying endorsements of the new and improved Sanding Sealer No. 2550 to date are from progressive furniture manufacturers throughout the country, who have made actual tests on their own work under working conditions in their own shops. The result of such tests has afforded the opportunity of working on a comparative basis. By comparison Sanding Sealer No. 2550 has set a new and convincing standard for higher operating efficiency at a tremendous reduction in production costs. In many cases savings of from 30% to 50% have been effected.

If a bona-fide saving of from 30% to 50% in production overhead interests you as a furniture manufacturer, why not permit us to send you, without cost, a generous sample with full instructions?

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"Herewith is article the writer promised you for your publication. I trust you will find this in good order."— Very truly yours,

H. H. Dyer, Jr.,
Foreman Finishing Dept.

FINISHING FABRIC FOR AIRPLANES

Foreman finisher of Command-Aire* explains the requirements involved in finishing fabric covering for airplanes and reveals details of methods employed in this important work

By H. H. Dyer, Jr.

HAVE YOU ever called the covering of an airplane "canvas"? Well, that is just what it is not. Fabric used on airplanes must come up to rigid requirements, as must all materials used in aircraft manufacture. It weighs around 4½-oz. per square yard and must have from 80 to 84 threads per inch in warp and fill. It is then, one can see, a very good foundation for a satisfactory finish.

All airplanes are subject to extremes of exposure and more or less abusive treatment. Therefore, it is necessary to protect the high grade workmanship by taking the utmost care that all finishes are the best obtainable, regardless of cost. An airplane finish must be:

1—Flexible
2—Durable
3—Serviceable
  a—Easy to refinish
  b—Easy to repair and patch
4—Pleasing to the eye

The following procedure is used to satisfactorily obtain the above named requirements:

Our wings and empennage are finished in somewhat different manner from the fuselage, and the method subsequently described deals with the former.

*Airplanes; Little Rock, Ark.

Brushing on the Dope

After a surface has been covered tightly, panel stitched and trimmed, it is carried to the dope room. Here it is allowed to sit for two or three hours until it has dried out to the room temperature, which is held between 75° and 80° F. Nitrate clear and nitrate semi-pigmented and pigmented dopes are used. After drying, the surface is coated with clear nitrate dope, *brushed well into the fabric*, until thorough saturation is apparent. At least one hour drying time is allowed between all coats.

The second operation is the placing of all patches around the fittings and strut points and cutting the reinforced tape and edge tape. The patches are thoroughly saturated with dope, on a board or horse, and applied wet. The tape is then saturated by brushing clear dope on to it on a board or horse, and laid wet. It is important that all air be pressed out from under the tape, and this is best done by rubbing with the fingers. After all the tape has

Is this your "slow spot?"

DOES your production line move smoothly until it reaches the finishing department?

Perhaps a finish "engineered" to your product would remove the delay and speed up deliveries with quality improvement.

Our experimental finishing department is complete; 5'x7'9" electrical heated oven, with spray equipment, 5' booth, under direction of trained operators, and laboratory technicians will determine the Impervious product best suited for your requirements.

A recommended "Impervious" formula will be a demonstrated and proven product for which it is prepared.

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been placed and rubbed well, the entire surface is ready for a second coat. This and the three following coats are brushed.

A 4-in. wall brush is used with satisfactory results for all brush dope work. The second and third coats are of the same consistency as the first, unless the dope is too thick to spread well. In that case, it is necessary to thin to a brushing consistency with a good dope thinner, usually furnished by dope manufacturers.

Beginning with the third coat, and on all succeeding coats, it is necessary to exercise great care to avoid brushing too hard or too long, thereby causing the dope to roll up or "rope."

Herein it is seen that doping is quite different from brush painting. A spreading stroke in one direction and a leveling stroke in the opposite direction are all that are necessary with properly thinned dope.

Sanding; Blushing; Coloring

After the third coat of clear has dried the required time, the surface receives a light sanding to knock off the nap and dope bumps. (Fuselages receive one more coat of clear than the wings.)

It is a fact that doped surfaces are much more likely to blush than lacquered parts, because of the more volatile solvents contained in the dope, and also because of the thicker film. It is necessary to spray retarder on blushed surfaces with about 40-lbs. of air pressure before any succeeding coat may be applied.

After the surface is sanded, it is ready for color. Semi-pigmented dopes are used, thinned only if necessary to brushing consistency. Two coats of colored dope are brushed on, with proper drying intervals.

All five coats are brushed on by two men on each surface, the surface laying horizontally on fixed horses. The men work diagonally across from each other to prevent the dope being flipped into one another's eyes, and to allow the trailing man a chance to join smoothly the strokes in the center of the surface where they lap. The men work from 8-qt. buckets which they carry in their hands and which they refill, when necessary, from tanks. These tanks are of special build and hold two drums each. They are emptied by pumps similar to those used on oil drums.

After the surface has dried sufficiently—usually from two to five hours—it is sanded smooth. See that no sharp corners or tops of stitches are sanded through.

To Spray Booth

The surface is now ready for the spray booth. A coat of semi-pigmented dope is next sprayed on. This coat is mixed from fully pigmented dope with clear nitrate dope, pigmented dope, retarder and lacquer reducer. Proper drying time is allowed.

The last coat is fairly thin and is used to give a gloss and, to a degree, "burn in" the finish and help level it out and to cut down the highlights. It is a mixture of semi-pigmented dope, retarder and lacquer reducer. Both coats are sprayed on under pressure of 20-lbs. in the tank and 60 to 65-lbs. on the gun.

The fuselage finish differs from the above procedure only after it has had four coats of clear. It is then sanded well and sprayed with two coats of semi-pigmented dope, under pressure of from 10 to 20-lbs. in the tank and 60 to 65-lbs. on the gun. After thoroughly drying from 2 to 5

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Lower Price Level

may

Increase Your Profits

The recently reduced price of acetone suggests that all users of solvents should **re-investigate** the possibilities which acetone may now have for lowering their production costs.

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PLANTS: Terre Haute, Ind., and Peoria, Ill.

hours, it is sanded smooth. It then has two medium thin coats mixed from pigmented dope, clear, retarder and lacquer reducer, sprayed on with 20-lbs. air in the tank and 65-lbs. on the gun.

Why Linseed Oil Caused Trouble

Recently one of the traveling representatives for a certain manufacturer of finishing materials offered a suggestion that caused a firm using finishes quite a lot of trouble and expense. On a certain style of radio cabinet, certain places—sunken below the main surface and so small and inaccessible as to be hard to clean—when filled along with the rest of cabinet caused considerable extra labor and expense in cleaning, rubbing, or grassing off the filler. The field man suggested the use of linseed oil on these low places, and the omission of filler.

Think of it! Raw linseed oil; no dryer or varnish or japan; nothing to aid in drying the oil. The oil was cut with one part naphtha to three of oil. One job was finished using this treatment and by chance it came through okeh. Then the next day's production was started with this method of finishing; when the cabinets were lacquered every one of them blistered around the corners and edges; the finish had to be removed and the cabinets were later refinished.

Most anyone should have seen or known what the result would be with raw linseed oil under lacquer. It would have been a risk to have used linseed oil with a drier, and to have oven-heated the cabinet to 180-deg. F. for about five hours, let alone trying to get by with raw linseed air dried over night. All of which goes to prove that field men should know not only their own materials, but should have a thorough knowledge of any and all materials that are used (or which might be used) in a finishing room; and they should know what the results will be without guessing. A man should refrain from making any suggestions unless he is reasonably sure he is correct.—M.V.L.

It is a responsibility of the finishing-materials industry to provide a suitable, economical and lasting finish to renew old automobiles now in use and to enable the new cars to "look new longer."

Cooper Hewitt Changed to General Electric Vapor Lamp Co.

The Cooper Hewitt Electric Co. will be known as the General Electric Vapor Lamp Co. on and after January 1, according to William A. D. Evans, President. The trademark "Cooper Hewitt," heretofore used, will be retained as the trade designation of the products manufactured by the General Electric Vapor Lamp Co. he stated.

"For the past ten years the Cooper Hewitt Co. has been a subsidiary of the General Electric Co.," Mr. Evans said, "and this change in name will coordinate its activities more closely with the General Electric Co. itself and will also permit the wider use of the General Electric monogram. It is expected that from time to time the products of the company will be added to. There will be no change in the general policy or personnel of the organization."

The Cooper Hewitt Electric Co. was formed in 1902 by George Westinghouse, Sr., and Dr. Peter Cooper Hewitt to exploit the pioneer inventions of the latter in mercury vapor apparatus.

The organization, whose plant is in Hoboken, N. J., specializes in the manufacture and sale of Cooper Hewitt lamps for industrial purposes, and for photographic studios, as well as quartz ultra-violet lamps, mercury switches, low voltage Neon tube lamps and Neon glow lamps.

Faster, better, cheaper to use

THOSE who do not use Lingerwett Remover undoubtedly think of it as "just another remover." Those who do use it, *know* how entirely different it is. They know from actual experience that it is definitely superior to any other remover, both in the way it acts and in the results they get.

Lingerwett is faster, more thorough and efficient, and cheaper to use, *because* of its efficiency.

We are sure that if Lingerwett has proved so superior to thousands of painters and other users that it has become the largest selling remover in America, it will also demonstrate its superiority to you.

We urge that you get a can from your regular source of supply, and give Lingerwett a thorough tryout in your work. If you would like a trial can, we shall be glad to send it to you free. The coupon is for your convenience.

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Please send me a free trial can of Lingerwett Remover.

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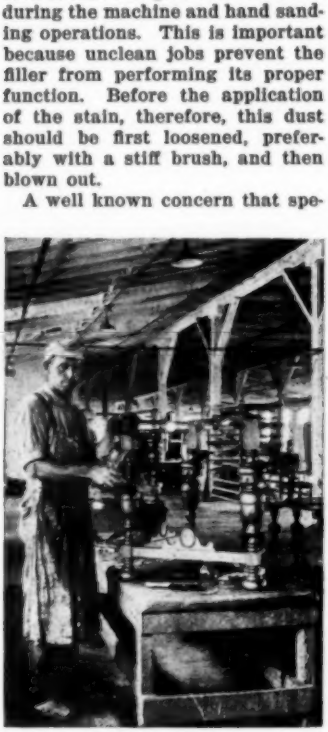
Cleaning and Filling Wood Surfaces

Featuring the details of preparing wood surfaces for finishing; including the sponging of veneered surfaces, staining, filling and rubbing off excess filler; also the naphtha, the drying time, etc.

By R. L. Kent

EVERY WOOD surface to be finished should be thoroughly cleaned of the fine dust that is forced into the pores of the wood during the machine and hand sanding operations. This is important because unclean jobs prevent the filler from performing its proper function. Before the application of the stain, therefore, this dust should be first loosened, preferably with a stiff brush, and then blown out.

A well known concern that specializes in lacquers and fillers and whose experts have devoted years of study to finishing problems, points out that, among the causes of poor filling one is due to glue sometimes being forced through the veneer with the result that it fills the pores and leaves no place for the filler to stick. Naturally, under such conditions, the filler doesn't fulfill its objective, and the final finish is applied over glue-filled pores.



This trouble is easily eliminated if the proper precautions are taken. Thoroughly sponging the veneer with warm water before the final sanding, and then allowing the resulting moisture to evaporate before the finishing coats are applied, will do the trick effectively.

With the job properly prepared for the application of the filler, there are still a number of considerations involved to insure perfect work. The first factor is the elimination of guesswork in determining the proper "thickness" of the filler. The best method is to weigh each batch of filler as it is thinned; then absolute certainty replaces chance. Many finishers weigh only the first batch, but later batches are made by using the same volume of filler and the same volume of naphtha.

The naphtha used for reducing

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Opex coverage is *greater* because of its higher percentage of solids. Opex gives a better, smoother film because of its richer solvent mixture. Binder and pigments are scientifically balanced to prevent breaking down or chalking, even under severe usage. These qualities are *constant*, due to careful laboratory control.

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filler should be pure. The presence of water, grease, sulphur or other foreign substances will do the filler no good and may cause considerable trouble in the final finish. Suitable naphtha should have the following properties:

1—A specific gravity of about .6560 (Baume 52 to 54-deg., lighter than water scale).

2—A flashpoint of about 43-deg., F.

3—A boiling point of about 220-deg. F.

4—An end point of about 420-deg. F.

It is essential also that only enough filler be mixed for the work to be done. Allowing mixed filler to stand over from one day to the next is an expensive form of waste because, when this is done, the filler becomes slow-drying. Mix a new batch each morning and at night throw away the leftover and clean the pot.

Filler should be applied thoroughly so that there is no chance of a half-way job. Keep the filler

stirred up. After the application of the filler, when it is in condition to be rubbed in, force it into the pores with a pad of burlap or other similar material. Wipe off excess filler with a circular motion to insure the filling of all pores. When cleaning off the excess filler, be careful to avoid pulling the filler from the pores; use a cloth and wipe first across the grain and then wipe lightly with the grain.

Finally, before the lacquer can be applied the filler must be absolutely dry. The filled jobs should be stacked so that the air has free circulation around all parts of the product. Forty-eight hours will usually permit thorough drying under natural conditions.

New Lacquer Book

Scott, Greenwood & Son, (trade and technical publishers) London, England, announces a new book entitled, "The Application of Cellulose Lacquers and Enamels," by A. E. Robinson. It contains chapters on the composition and characteristics of modern lacquers, automobile finishing and refinishing, lacquer finishing of metals, woods and fabrics, industrial finishes and effects, spraying equipment, brushing lacquers and the safeguarding of lacquer fire hazards.

This book of 152 pages, (5¼ x 8¼-in.) is attractively bound in green cloth, contains 29 illustrations, and is for sale in the United States by D. Van Nostrand Co., 250 Fourth Ave., New York City.

Hercules Will Sell on Net Weight Basis

Following investigations at its naval stores plants during the past year, the Hercules Powder Co. announces its readiness to supply, for the first time, wood rosin in wooden barrels on a net weight basis. This marketing innovation is expected to effect decided savings for the rosin consuming industry.

The net weight sales plan is instituted by Hercules in response to the desire by consumers for such action. Committees of rosin consumers, representing leading trade associations, have urged the sale of rosin on a net weight basis and the reduction of tares to a minimum.

Since the new marketing method is novel in the history of the industry, rosin consumers are expected to assist in the ultimate development of the most practical shipping package, still further promoting the economies of the new system.

DU-PROS PURE SHELLAC

Seals Stain IN

Seals Moisture OUT

THE double process makes Du-Pros a finer full-bodied shellac of close texture and smooth-flowing, free-sanding quality. Du-Pros offers more resistance to bleeding of stain and to moisture and wear. A finish using Du-Pros Pure Shellac is more economical than others built up with materials that produce a thinner film. Less time is needed to spray one heavier coat of Du-Pros than two thinner coats of other materials and more film body is secured with less waste. You get the same uniform film every time you use Du-Pros Pure Shellac. Use more of it to secure greatest quality and economy in your finish.

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CHICAGO

DECORATIVE STENCILING

Practical finisher submits suggestions and recommendations about stencil paints and about the design, cutting and use of stencils, illustrating same by relating one firm's costly experience with improper stencils

By M. V. Leach

FOR ORDINARY flat stenciling, I prefer to use lacquer stenciling colors and to apply them with a spray gun. Suitable stencil colors will cover solid in one or two passes with the spray gun and can be sprayed on at very low pressure (8 to 12-lbs.). The sprayed material will dry or set quickly and will show a good gloss. Successful stenciling is as much dependent upon good stencils as upon suitable colors and methods used. A poorly designed stencil—wherein no ties, or too few ties, or too many ties, or ties too large or improperly placed—will sometimes ruin a splendid decorative design.

Oiled paper is frequently used for making stencils, but if the design is such that no ties are permitted, it is best to use sheet lead, brass or zinc, so you can depend upon the stiffness of the metal to hold the projecting parts in position. On flat work it is well to have the article and stencil lie flat on a table top that revolves. A handy trick is to roll the lead stencil down flat to press it level or true with the surface to be decorated, using as a roller a length of steel shafting about 1 3/8-in. in diameter and long enough to reach across the stencil. Different conditions call for different devices.

A handy tool sometimes used is a wire potato masher, with the handle bent in offset position. The wires that press against the stencil should be made true with each other so that all will press alike. When used, the wire tool is moved from time to time so that those parts covered by it may be sprayed also. This kind of tool is especially useful with a stencil cut from cardboard 1/8-in. thick; this stencil thickness (1/8-in.) keeps the tool clear of the surface being painted. If a thin stencil is used, the wire tool, may touch and spoil the surface being painted.

Stencil decorating is a fascinating art, and when more finishers and decorators learn how to do it properly, it will increase in popularity. A little more attention should be given to this subject by those higher up in factory organizations—the management. Any aid offered through this magazine, that will help the stenciler produce neat, attractive work, will be more than welcome.

An experience I would like to record here has to do with screen stenciling with lacquer paste. A certain manufacturer of fine finishing materials desired to be of further service to a customer by offering a method of decorating. This method was with the screen process, using a lacquer paste—decorations to be applied to a lacquered surface.

Designs were adopted and screens and paste were furnished by the manufacturer of finishing

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materials. The designs were cataloged by the customer—a manufacturer of high-grade cabinets. After a few attempts made with the screen, it was found that the screen would have to be cleaned before putting it away each time, and anything that would clean the screen would damage the filler (the blocked-out parts) so badly that it "leaked" too much to be of any further use.

Now get this! The stencil screen and lacquer paste were given up as being impractical; but the designs had been cataloged, samples had been made and some of the merchandise had been sold. Customers expected this design and it was up to the cabinet manufacturer to make good.

The design was "tieless." All the cabinet manufacturer could do was to have stencils cut from stencil board or paper and spray them on, but the design was such that it was next to impossible to hold the stencil down while spraying. As a result, edges were indistinct and blurred instead of being sharp and clean cut. Many complaints were made. Also, after one of the stencils had been used once or twice, the lacquer drying on same caused the edges and points to curl up, with the result that the stencil had to be thrown away after a few designs were made with it.

Most of this trouble could have been avoided by having the stencils cut from sheet lead or heavy cardboard 1/8-in. thick. The lead could be cleaned easily by suspending it in lacquer cleaner. Either type of stencil could be held down to the surface by using the wire tool already described.

No industrial enterprise in this country is so big that the proprietors are not dreaming of expansion.

Out of this present restlessness —this desire to turn today's luxuries into tomorrow's necessities —is hatched the spirit of achievement.

Buffer, Polisher Bulletin

The "1930" series of "AutoStart Grinders & Buffers" is the subject of an interesting bulletin recently issued by U. S. Electrical Mfg. Co., with head offices in Los Angeles, Calif.

AutoStart grinders and buffers, as manufactured by this western firm, embody asbestos protected windings, anti-friction ball bearings, cast aluminum rotor and other features of interest. The motor is a totally enclosed power unit and, according to the bulletin, is manufactured in sizes from ½ to 5-h.p., accommodating wheels from 10 to 18-in. in diameter. These grinders and buffers are made with both bench and pedestal mountings.

Atlas Electric Devices Co. Moves

The Atlas Electric Devices Co., Inc., (mfrs. of the Fad-ometer, Launder-ometer & Weather-ometer) 360 W. Superior St., Chicago, Ill., announces that:

"We are compelled to move from our present location into larger quarters before the expiration of our present ten-year lease, in order to take care of the great demand for testing equipment.

"Beginning January 1, 1930, we will occupy the entire second floor of the Huron & Orleans Building 'B.' Our address will be 361 West Superior St., Chicago, Ill.

"It might interest you to know that our sales for nine months of 1929 showed an increase of 125 percent over the entire amount of sales for 1928. An increase has been shown every year for the past ten years."

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M & L service to the industrial user of varnishes, enamels and lacquers is a tangible, definite thing that can be demonstrated to your profitable satisfaction. Ordinary Service may be interpreted as prompt, courteous attention to your inquiries and orders . . . . an indefinable, abstract thing which it is difficult to measure. ¶ But there is a more explicit . . . more thorough . . . service which calls for close contact with, and definite knowledge of your problems . . . and the ability and willingness to DO SOMETHING about them. Most of these problems cannot be solved by using standardized industrial finishes. For years it has been our policy to create the finish for the job . . . to call upon the ingenuity of our laboratory staff to create new products which will fill the unusual requirements of YOUR SPECIFIC PROBLEMS. ¶ This service you will find at MAYER & LOEWENSTEIN'S large modern plant . . . and there only. It has already created special finishes . . . dipping enamels . . . quick-drying varnishes . . . weather, heat, and storm proof finishes . . . fillers and first coaters with unusual properties . . . which have since been absorbed into the ever-growing M & L line as standard M & L finishes. ¶ You will be surprised to learn how closely our staff is willing to work with you . . . beyond the closely drawn line which separates standardized finishes from the material that will meet YOUR peculiar requirements. ¶ A line on your letterhead will bring a skilled, experienced representative to talk over your problem understandingly, and help us solve your difficulty to our mutual profit.

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ESTABLISHED 1846

The beauty and richness of genuine hardwoods can be brought out and preserved only through the use of high-grade materials, skillfully applied and properly conditioned after application

By W. R. Beutin

Improved Finishing in Wood

MANY CHANGES have occured in wood finishing methods, materials and equipment during the past few years. More new equipment and new materials are being developed, and more radical changes in methods of application are likely to appear. Not being a chemist, I cannot forecast with accuracy what these radical changes will be, but I do know they must be for the improvement of the industry.

A lively interest exists among lumber manufacturers and lumber importers in regard to the treatment of their products by manufacturers of furniture. Their object is quite natural and obvious. While the lumbermen undoubtably do much in the interests of the furniture manufacturer, they naturally endeavor to promote their own interests.

Genuine Hardwoods

The manufacturers and dealers in walnut lumber, for example, seek to advance the sale of this fine wood in competition with cheaper woods such as birch and elm which may be stained to imitate walnut. Likewise the manufacturers, importers and dealers in mahogany meet the competition of gum, birch, white pine and other woods that can be and are being finished to imitate the color of mahogany.

These lumber and veneer manufacturers, importers and dealers employ expert chemists and finishers to develop finishes which will show up attractively and in accordance with the prevailing and future styles which are now or will be in demand. Some wonderful results are accomplished through research work.

Wood finishing is a technical art of high order, but it has been cheapened by the practice of finishing walnut and mahogany excessively dark in order to more easily disguise the gum or birch, which is so often combined with these more expensive woods.

A FINISH should Build Sales

How often has your personal buying been influenced by the appearance of an article? The finish on *your* product has the power to attract favorable attention, or relegate it to competitive obscurity. It is important, therefore, that you choose a finish which will help build sales.

Such a finish is *Thresher-Lac Clear Gloss Spraying Lacquer*. The knowledge and experience gained in nearly three quarters of a century of manufacturing varnish, enamel and lacquer of unvaryingly high quality have produced in this finish a clear lacquer of *unusual* beauty and durability.

Thresher-Lac Clear Gloss Spraying Lacquer makes a smooth, deep, absolutely waterproof film. It dries with a beautiful high gloss which will easily rub to a rich, satin finish. An elegant rubbed effect also may be obtained by using Thresher-Lac Clear Flat Spraying Lacquer.

Thresher-Lac *is* dependable. Its use will assure your product every sales advantage which a good finish makes possible.

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Artistic Originality

Dominance of manufacturing considerations and the monopoly of the craftsman's finishing knowledge are two factors that have tended to discourage artistic originality in wood finishing. The production-trained craftsman, being concerned chiefly with economical production routine, naturally endeavors to standardize his work with as few operations and materials as possible. He is likely to take sides with the engineer against the designer, opposing the introduction of new effects and technique which exhibit artistic expression. To achieve higher standards of finishing, designers must be given more freedom of expression.

Asbestos Drop Curtain Protects Spray Booths

In our finishing department we have installed something we believe will be of great help in reducing the damage that would surely be done in case we should ever have another lacquer spray-booth fire. It is almost impossible to put out a lacquer fire; it usually just burns itself out. This being the case it is well to consider some means of controlling the flames as much as possible so that the fire will not spread and damage the building.

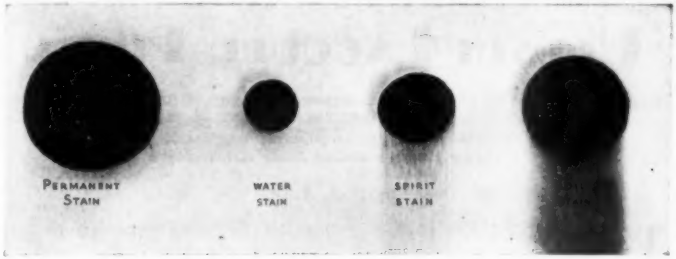
We have installed a drop curtain of asbestos; one edge is fastened to the top front edge of the spray booth while the opposite edge is attached to an iron rod or pipe the same width as the curtain. This curtain is rolled up around the iron pipe and held to the top of the spray booth by wires that have fusible links which melt as soon as a fire gets under way. The melting of the fusible links promptly releases the asbestos curtain which quickly unrolls and closes up the front of the spray booth. After this occurs, the only outlet for the smoke and flames is through the exhaust pipes at the back of the spray booth.—Earl Randall.

Sand Correctly in the White

The first sanding is of as much importance to the final finish as the last coat of lacquer. I believe that for a good finish, the bare wood should have special attention in regard to sanding with the proper grades of sandpaper used by someone who knows "why" as well as "how." Recently, some cabinets with walnut veneered panels, in which the grain ran lengthwise with the panels, were sanded on a machine operated by a boy.

The boy's instructions were to "sand lengthwise with the panel." Later, a job came along calling for cabinets of a different model with similar panels wherein the grain ran diagonally across the panel. Remembering his previous instructions, the boy continued to sand lengthwise of the panel although now he was sanding diagonally across the grain. No one had told him to shift the position of the cabinet to make the direction of sanding come parallel with the grain in the face veneers. Result: Lots of bad scratches on the panels until proper instructions were given.—M.V.L.

Modern art is a product of the present age. It is a development in beautifying, decoration, and design that reflects modernized life and denotes the freedom of thought and movement that has become characteristic of the mid-twentieth century.



A little drop of stain can tell a big story

One drop each of Murphy Permanent Stain, Water Stain, Spirit Stain and Oil Stain was carefully measured onto a piece of semi-glazed cardboard. The next day a coat of lacquer was flowed over the cardboard, and the above photograph taken.

These little drops tell a big story.

First, their spread illustrates the relative penetration of each type of stain.

Second, they show the relative staining efficiency. Notice the absolutely uniform color of the Permanent Stain; and compare it with the dark rings in the interior of the Spirit and Oil Stain drops and around the circumference of the Water Stain. The dark spots are color which has been precipitated out in the dry state, and measures the amount of color you pay for—and get no return from—every time you use those stains. There is no such loss with Murphy Permanent Stain because every particle of color is distributed to the wood in "liquid" form, before any precipitation occurs. The savings over Water Stain are very high, in this particular connection.

Third, they show the "bleeding" of Oil and Spirit Stains and the fastness of the Water and Permanent Stains.

Murphy Permanent Stain approaches the ideal—It dries to take filler in a few minutes, and leaves no foreign residue.

It does not raise the grain of the wood

It penetrates deeply and rapidly

It does not bleed

It is fast to light

and above all, it is NOT an experiment.

One important cabinet manufacturer, who formerly used Water Stain, tells us Murphy Permanent Stain saved him over $10,000 in six months of 1929.

Convinced by the proofs of actual production results that we can go but little further in perfecting it, Murphy Permanent Stain is now released for general sale.

The important savings and improvements in finish you can make, demand your investigation.

We shall be glad to send you further information, or to give you a demonstration.

Murphy Permanent Stain is licensed by the Chadeloid Chemical Company.

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Essex Varnish Company, Newark

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URUSHI LACQUER FINISH

Expert Finisher in charge of Lacquer Dept. at Mikami Studios, New York City, reveals additional interesting information about the Urushi lacquers of the Orient and explains something further about their use today

By F. S. Araki

THE CHEMICAL side of *urushi** is now quite adequately covered by the scientists whose findings and reports are available in English, German, French, and Japanese languages. As for technical data, they are remarkably scarce even in Japanese. This is probably due to the fact that the chemists are not very well acquainted with the ordinary working methods and condition of *urushi*, and the workingmen are either averse to come out in the open or unable to express themselves.

I shall concern myself here with only the technical viewpoints and will try to answer some questions as nearly as practicable, either directly or indirectly, and hope I have succeeded. Other questions cannot be answered in a few pages, so I shall have to wait (to answer them) till I have more time.

The Old and the New

Yes, I believe we can produce the kind of work (finish) identical to that of the Emperor's chair†, today, if there is demand for it. It must not be baked, in my opinion, if the finish is expected to last several hundred years—perhaps over a thousand years. The oxidation and polimerization should be slow and gradual, and made so that it will not become dead dry.

The Romans knew the secret of how to make a cement that will not dry thoroughly—and that accounts for some of their buildings being just as strong after 2,000 years, as the day they were built; and the engineers say they are good for another 2,000 years.

Shipwrecked Antiques

I have the following story from a merchant in Kyoto (Japan). At the time of the World's Exposition in Vienna (Austrian International Exposition, 1873), some $250,000 worth of antiques and new Japanese lacquered articles were shipped to Europe. Unfortunately they did not reach their destination, for the S. S. Nile (British) that carried them was wrecked and went down to the bottom off Cape Idson. The owners were very much grieved, for some of the articles in that shipment were very rare antiques which could not be replaced and were not for sale, but were intended for exhibition only.

The owners of these rare and valuable articles had only consented to part with their goods temporarily, upon assurance of its safe return. Accordingly it was heavily insured. The insurance

*Commonly called "Japanese lacquer"; an exudation (sap) of "tsi ziu" of China or "urushi no ki" of Japan, a species of poison sumach called "rhus verniciferus" (Japanese varnish tree).

†Ta Ming Kwoh, Emperor of the Ming dynasty in China; see page 30, Dec. 1928, and page 95, Feb. 1929, INDUSTRIAL FINISHING magazine.

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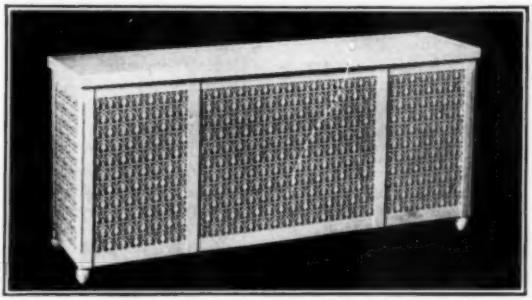

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"Kimpak is used exclusively in the packing of Trico Radiator Covers and Enclosures. It assumes the major portion of our packing process. Kimpak has proven to be the only logical protection against the marring of the high grade finishes on our products. It is with sincerest satisfaction that we recommend its use in packing highly polished and well finished metal products."

Trico, Inc., Chicago
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companies were not so anxious to part with their money either, so an attempt was made to salvage this precious cargo. Fortunately it proved a success. Divers brought out most of the valuable articles from 11 fathoms of salt water after 18 months of immersion. All of the antiques were in perfect condition, as though nothing had happened to them, and some new articles were all right; others were slightly damaged or totally ruined. It does not depend so much on what material is used as on how it is used—how the work is done.

Urushi poisoning, as has been explained already in INDUSTRIAL FINISHING, should not be a serious drawback. It is only when it is fresh and raw that it behaves somewhat like poison ivy on the skin. Usually it has a slight effect or no action at all on those who handle it often. However, to those who are afraid of it, I suggest they test the reaction for an individual case by rubbing a tiny bit of urushi on the skin.

Several Kinds of Urushis

Urushi is not sold in this country at present, and we are importing direct from Japan. The prices vary a great deal from the cheapest *Seshime* to purest *Kiurushi*. It is impossible for me to comply with the requests of those who desire some specimen of urushi, as there are some 20 kinds of urushis, and different grades. It simply cannot be done—to send a little of all kinds and prepare the directions for each. We buy seven or eight varieties, and others we prepare ourselves when occasion demands, but usually we manage to make them go. I enumerate here the most important of them, probably for the first time in the English language:

Kishomi: Pure natural urushi used for making other urishis and high class priming and finishing.

Seshime: Taken from branches and leaves of *rhus vernicifera*. Mostly for undercoat and building the ground; also for rubbing.

Roiro: Pure black urushi, containing no oil. Needs polishing. Mostly used for the finish coating.

Uwabana: Black urushi containing 20% or more of oil. For medium grade of work. Requires no polishing.

Nakanuri: Contains about 10% oil. Used for primer and middle coats.

Nashiji: Prepared specially. Translucent, and contains no oil. Used for colors.

Shuai: Translucent. Used for same purposes as *Nashiji* but requires no rubbing. Contains 20% or more of oil.

Suki Nakanuri: Used mainly for between coats, also for primer and finishing coats.

Shun Nuri: Contains 30% to 40% oil and other ingredients. Translucent and not very strong.

Rose: Used as the size. Very strong and spreads very easily.

The drying of urushi is done either in a moist chamber at the temperature of below 30° C. (86° F.) or in an oven at 100° to 200° C. (212° to 392° F.) In the former case it takes a day to several days to dry according to the thickness of coating. In the latter case about 15 minutes to several hours which depends on the colors used and quality of work required. Too high a temperature is not advisable except for the black.

For the lower grade of work, the amount of oil used is greater than that of urushi itself. This makes the drying process much easier and saves time, as it need not be polished. Of course, in this sort of work, we cannot expect the

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bottom sheen or deep quiet luster which is a characteristic of the expensive work.

Colored Urushis

Colored urushis are prepared from *Nashiji*, and the proportion is half and half by volume for the undercoats; and pigments are decreased in subsequent coatings. Finishing is always done in pure urushi without any color. Most pigments undergo a chemical decomposition when they come in contact with urushi and for that reason they are amazingly restricted; only a few are in actual use. It is possible some combinations may work wonders. Later on I shall take up the pigments and their properties more thoroughly.

Briefly stating, we make use of five colors—black, red, blue, yellow and white. Of these we cannot produce a perfect white in urushi at present. The best we can do is a yellowish, greenish or grayish white, and we do not expect to get the desired effect in a hurry either; I have tried almost everything known or obtainable, with little encouragement so far.

White pigments for urushi which give more or less satisfactory results are *titanium oxide* and *bismuth oxychloride*.

Black: Iron powder or some compounds of iron. Very good.

Red: Amorphous mercury sulphide, that is in every day language called quicksilver; vermilion mostly used.

Blue: Ferric-ferro cyanide, commercially called Prussian blue, is highly satisfactory. Green is made with this and orpiment.

Yellow: Arsenious sulphide or commonly called orpiment used exclusively.

Other pigments are used to a certain extent but they are not quite likable.

Color In Gas Appliances

Color and style are rampant in the showing of the new gas appliances in the stores of the country today. The latest gas ranges come in a wide range of beautiful colors that lend themselves very readily to the many plans of home decoration in the kitchens of today, besides increasing the sales of dealers tremendously.

In place of the old black gas range the modern housewife is offered the choice of fine ranges that come in a wide range of colors including spring green, jade green, royal blue, and various two-tone effects such as tan and ivory, tan and green, etc.

Even the gas furnace has not escaped this touch of the modern master of color, for in many of the large showrooms one visits, these furnaces are shown in colors too. Also, in many cases, the gas pipes in modern homes are done in color to add a touch of beauty and place them in harmony with the rest of the interior.—A. J. Owen.

Hercules Issues New Illustrated Booklet

A four color photomicrograph of abietic acid crystals grown in rosin is a feature of a 51-page booklet just issued, describing the chemical products of the Hercules Powder Co.

According to the booklet, abietic acid is a cheap organic acid which research indicates will develop wide commercial use. It is one of a number of terpene chemicals and organic compounds discussed.

The properties and specifications of Hercules naval stores, nitrocellulose, cotton linters, and acids are described in the booklet; and included are historical details and notes on processes employed by Hercules and the industry in general.

The booklet is well illustrated with plant and laboratory scenes. It may be had without cost by writing to the Hercules Powder Co., Wilmington, Del.

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Preliminary Treatment in Wood Finishing

Sandblasted Antique Oak Lacquer Finished

Foreman Finisher of Store Equipment Corporation relates his experience in devising a finishing system and schedule for a store fixture job in antique oak to match a sample panel submitted

By E. T. Miller

RECENTLY a sample of finished wood panel was handed me to match. It was oak of the antique variety in a very rich shade of brown—a beautiful object to look at. The surface had the appearance of having been eaten away in places, leaving the hard grain of oak standing out in sharp relief against a soft background.

To determine the process of making this finish was not an easy matter. I knew it had not been combed with a wire brush, as that would have given it a coarse appearance and wouldn't have dug out the soft grain of the oak, as was the case with this sample. To burn it with a blow torch would destroy the color, and I knew of no acid strong enough to affect the oak in the way this sample apparently had been treated. Well, there was only about one thing left and that was sandblast.

Experimental Work

I took a small piece of oak—plain oak, not quarter-sawed—and sandblasted this to the appearance of the sample. After several attempts I determined the right amount of sand to use and the necessary air pressure to give results. After sandblasting several pieces with the adjustments set to give just the right amount of sand and air, I had my wood surface ready for the color.

At first glance, this color reminded me of a rich fumed oak. I tried a fumed-oak acid stain, thinning it to compensate for the roughness of the oak to avoid staining the wood too dark. This stain, I found, would not do, so I turned to water stain. After a few attempts, I found how to produce the right color, but still I didn't seem to be on the right track.

My next and final trial was with oil stain. This began to lead me towards the results I wanted and, after several attempts, I had worked out a simple formula which made the sandblasted oak surface look like the original color. This formula was made up of naphtha, asphaltum, oil-soluble black powder and a small percentage of golden oak combination stain and filler. The filler acting as a stop, the small amount that was in the stain settled in the rough parts of the wood and helped hold out the following finishing coats of lacquer that were used as the final finish.

After leaving this stain dry for the required length of time, a coat of lacquer primer was applied. Then the surface was sanded

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lightly to remove roughness. Two coats of lacquer were applied. The rubbing did not take much time as the surface was simply "oiled off" with burlap and a little powdered pumice.

Wood in the White

In producing an article in this finish, there is no need of sanding the wood in the white—neither in the millroom, cabinet room or assembly room. The wood can go into the assembly department in the rough, just as it comes from the planer or other machinery. No attention need to be paid to nail holes, worm holes or knot holes, and a few checks or cracks in the wood helps along the finish, as this is supposed to be antique. Of course, this can be overdone. Reasonable precautions must be taken in the selection of the material that goes into the construction of this work.

This finish, when applied to a line of store fixtures, makes a very pleasing appearance and requires little care or attention to keep it in good condition. The wearing qualities of this finish are excellent; all of the hard parts (hard grain) of the wood stand out in bold relief, and will not show the usual wear that occurs on other finishes.

All wood parts are assembled as they come from the millroom, all glue being cleaned off to make the surface ready for the finish; no sanding of any kind is required. After leaving the assembly room, the articles are ready to be sandblasted. The sandblast operator must be continually on his guard in every operation, or he will cut too deeply in some places and not deeply enough in others. The amount of cutting should be as nearly uniform as possible. After sandblasting, the surface is thoroughly cleaned to remove all traces of sand that may be left.

The stain can be applied either with a brush or spray gun. However, if it is sprayed, an agitator must be used in the stain to keep the filler pigment well mixed with the stain.

This finish has been used to a great extent by manufacturers of store furniture and fixtures, and it is still popular although the present trend is toward modernistic effects.

We are turning out some beautiful stores in the present modernistic designs, and I will attempt to describe some of them in a future issue of INDUSTRIAL FINISHING.

In the meantime I hope to have an opportunity to read more articles about the finishing of fixtures and other wood products in this journal.

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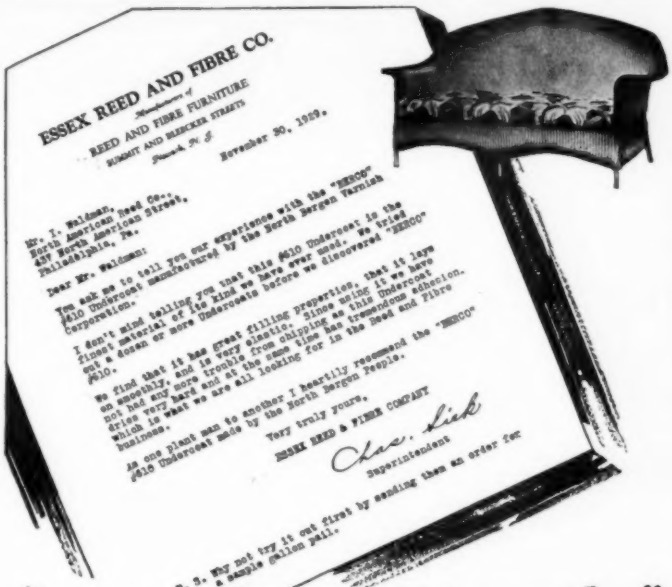
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Lacquer Finish Schedule for Railway Coaches

Suggesting the type of undercoats and finish coats suitable for railway coachwork and submitting a detailed schedule of operations for a typical steel or aluminum coach finishing job

By J. C. Alsee

BASICLY the same type of lacquer is recommended for railway coaches as is applied to motor car bodies. However, the greater degree of contraction and expansion required, due to the stress met with by long railway coaches going over bumpy roads and around sharp curves, and the tendency of such cars to give at the seams and near the windows, must be carefully considered.

Lacquers, we are reminded, dry only by the evaporation of the volatile solvents, leaving a hard and durable finish that will withstand hard usage. Almost every railway has on its road several coaches finished in lacquer. These jobs are primarily for testing purposes, the coaches being mostly those of steel construction.

It is not safe to recommend nitrocellulose lacquer for use on wooden coaches because, if any cracking of the film occurs and moisture gets into the cracks, the finish will begin to come off prematurely. Wood absorbs moisture and has a pronounced degree of contraction and expansion in comparison to steel.

It is my belief that a primer or undercoater built on a true nitrocellulose base should not be applied directly onto the metallic body; while desirable results have been secured through the use of this type of primer in the motor car industry, one cannot safely compare these results with application to larger metallic bodies which are subjected to such strains and stresses as railroad rolling stock.

The coating between the metal and finish coats should be of flexible nature so it can contract and expand considerably. The undercoater should be built on the basis of oil-type materials, and further—owing to the solvent content of the nitrocellulose lacquers—care should be used in the selection of the paint-like undercoater, the aim being to secure one that will not lift when the lacquer solvents included in the lacquer are applied.

Suggested Schedules

In accordance with the quality of the finish that is desired, the following schedule can be so revised to meet ordinary requirements. These operations involve spray gun application.

1—All dust, dirt and foreign matter should be removed from the car surface, preferably by sandblasting. About 24 hours should be allowed for drying before the application of further coatings.

2—Spray one coat of red oxide metal primer, reduced with the

proper type of recommended reducer to a spraying consistency; this is an air-drying product and should be allowed 24 hours drying time.

3—Surface conditions depending, spray the necessary applications of dark red or gray sanding surfacer (paint product), reduced to spraying consistency through the introduction of a properly recommended reducing medium. The number of coats or operations depend on the type of finish and the condition of the surface. If more than one coat is desired, about 4 hours drying should be allowed between operations. At least 12 hours air drying should be essential before sanding operations.

4—After 12 hours drying, the surface should be watersanded lightly; then, allowing a reasonable time (about 2 hours) for the moisture to evaporate from the surface, apply a glazing putty by knifing-in, allow 5 to 6 hours drying before sanding to the desired surface. (If desired, the preliminary sanding operation can be eliminated.)

5—A lacquer sealer—sometimes termed an intermediate coat—is next applied; this is reduced in accordance with conditions governing the spray gun and the body of the sealer. It is reduced with the recommended type of reducer and is usually allowed 4 to 5 hours drying before it receives light sanding.

6—Inspect surface carefully and spot putty where necessary, using a lacquer putty.

7—Apply two coats of lacquer of the desired color. This is sprayed, the lacquer having first been reduced in accordance with the proper reducer; after having dried for 6 to 8 hours, the surface can be sanded with gasoline. If gasoline is used in connection with sanding, it is advisable to spray another doublehead coat of lacquer enamel, which can be done after about 2 hours instead of 6 to 8 hours; however, force should not be used in this sanding; rather a light scuffing.

8—Mist coat with lacquer mist-coat-reducer, or if the job is to receive a polish, it should first be allowed to stand overnight. Another suggestion is to take the lacquer manufacturer's recommendation of a clear finishing lacquer and apply it directly to the surface; or, as a safer medium, it is suggested that the clear finishing medium be used in the proportion of 90% clear to 10% of the desired colored enamel. These are mixed together and then reduced 100% to a spraying consistency and applied. This latter recommendation seems logical in view of any question of the actinic sun rays breaking down a film of clear lacquer.

9—After finishing operations, an overnight drying is recommended before the application of lettering and striping. In view of this recommended schedule being lacquer, best results can be secured through the use of a striping lacquer reduced to the proper consistency for use with a brush or striping device.* Gold or aluminum lettering can be applied if desired. If this is to be done, a size should be applied first before the leaf. At least 12 hours should be allowed for drying and a coat of pencil varnish should be applied, followed in 8 hours by a second application to a finish.

To my mind there are certain advantages in the use of nitrocellulose lacquer; some of them are:

1—Rapid schedule, due to rapid-drying materials.

2—Mechanical means of application (spray) is a saving of labor.

3—Permanency of color and beauty of finish.

4—Ease of patching damaged spots.

Combating Corrosion

The corrosion of metal is the cause of much concern to those interested in its application to railway equipment and to other metallic surfaces. It is a known fact that wood will rot and present greater affinity to contract and expand under climatic conditions. It is generally assumed that metal, when properly protected, will last indefinitely; however the selection of a suitable protective coating and its proper application has a great bearing toward this end.

A few experimental railway cars have been built wherein specially treated aluminum is the chief surface metal used. These cars are purely experimental and may or may not replace the present structural steel type cars. Certain advantages are apparent in a coach built of aluminum in that the lighter weight is a big factor. Another feature is aluminum's characteristic of taking protective coatings more readily and apparently outliving the corresponding steel; this statement is made purely from the viewpoint of the comparison of steel to aluminum as regards corrosion.

Glue Causes Finish Trouble

A great deal of wood finishing trouble could be avoided if the surplus glue were cleaned from wood where joints are made. This surplus glue will not permit fillers and stains to penetrate where it covers the wood; as a result we have an ugly finish at these places.

Another trouble is caused by glue being squeezed through the faces of veneered panels by the press; the glue is forced through the pores of the wood in spots and it is very hard to see until stain and filler are applied. As soon as this condition is discovered, it should be corrected by sponging the surface with hot water, softening the glue, scraping it out as much as possible and then sanding the surface to slightly roughen the spots so that stain will penetrate as much as possible; then proceed with the filling. It is better to find and fix these spots in the stain and filler, than to try to correct them after the finishing job is completed.

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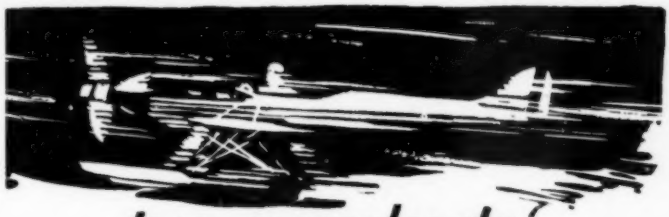

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How to Avoid Muddy Blotchy Finishing

Foreman Finisher of The Store Kraft Manufacturing Co., calls attention to some of the causes of muddy looking, blotchy or "painted" finish effects on clear lacquer finished hardwood, and tells how to avoid same

By E. B. Smethers

IN PRODUCING a complete finish on any article or surface, a conscientious finisher, who really takes great pride in producing the best results, works to bring out the characteristic texture and grain of the wood and to retain same through each operation. This beautiful transparency in a wood finish can be lost through any one of a number of causes; for example, in the sanding, staining, filling or rubbing operation.

A beautiful piece of walnut veneer may look blotchy in the finished product because of improper sanding—or through the use of unsuitable grades of sandpaper. Uniformity in sanding is particularly essential, as the so called "skips" (skipped places) will surely cause blotches to appear after the surface is filled. Such woods as walnut veneer, although usually stained with an oil stain which does not raise the grain, must nevertheless be sanded with a very fine grade of sandpaper—if one expects a high grade finish. Such woods, smoothed off with a coarse sandpaper, will fuzz, causing the stain to penetrate in such a manner as to detract from the transparency of the finish.

Stain; Sanding; Filler

Mahogany, especially African, must be sanded very carefully and with a fine grade of finishing paper to remove the surface fuzz. Water stains are used almost altogether on mahogany and, of course, these stains raise the fuzz, which must be sanded off smoothly and uniformly; otherwise filler will gather the fuzz and cause dark blotches. At the same time, care must be taken to avoid cutting through the stain with sandpaper, as a faded appearance would be the result.

After a time some clear finishes on woodwork appear to have lost their transparency and take on more of a painted appearance, due to the fact that the stain dyes were not thoroughly dissolved in the solvent. Insoluble colors have a tendency to cover and hide the natural wood, whereas thoroughly dissolved dyes will penetrate and give the desirable clear color to the wood.

After sponging a wood preparatory to staining it with water stain, particular care must be taken to avoid sanding too deeply. This can be accomplished more easily when a fine grade of sandpaper is used. A finisher cannot see or tell that the sponged part has been cut through and, unsuspectingly, he applies the stain only to find that it "takes" unevenly, the cut-through pieces not taking the stain as deeply as the rest of the surface.

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A grayish clouded cast can easily result from not stirring the filler while using it. In such cases the top portion of the filler in the container has too much oil, while the bottom part will be short of oil because the pigment has settled to the bottom. Any filler that is thus deprived of its oil will usually turn gray in the pores of practically any kind of wood, and especially on mahogany.

Wash Coat of Shellac

The majority of finishers give mahogany a very thin wash coat of shellac before filling. Filler applied to mahogany thus treated, naturally does not require as much oil as when applied to the bare wood; the shellac seals up the pores of the wood and prevents them from pulling the oil from the filler, leaving it, when dry, the same color as when in the liquid state. Now if filler is applied to the bare wood, more oil must be added, or grayish pores will be the result due to the fact that oil will be drawn from the filler, leaving the pigment unprotected; as a result the pigment becomes opaque showing very gray beside the colored mahogany.

Some trouble is encountered at times in using white shellac; it turns gray or, as is sometimes said, it "blooms." Shellac, having an affinity for moisture, draws it out of the air, giving the shellaced surface a white effect. Such troubles can be eliminated by providing and using a dry room, or by having a means of controlling the humidity in the air.

Lacquer Blushing

Some, at least, of the new lacquer sanding sealers now so popular, are very sensitive to any air drafts on hot humid days. The finished surface takes on a very muddy looking cast that is entirely different from the usual so called "blushing." Both of these troubles have occurred and there is a marked difference between them.

The blushing is easily removed by merely spraying on a coat of thinner, but sometimes it takes two or three coats to remove the other trouble and even then small traces usually can be found somewhere on the surface. Of course, both troubles can be and are eliminated by avoiding drafts and holding a relative humidity at from 40 to 60%. I cannot explain this troublesome gray at the present time, but probably I will be able to do so at a later date.

Synthetic Condensation Resins in New Lacquers

There are finishers connected with the lacquer consuming industry who are never interested in what goes into the lacquer in its making. They say they are only interested in what kind of results the finished product will give them.

Of course, the finisher's primary concern should be in the results obtained with the material in use. Yet we all know that the results obtained must necessarily depend upon the actual composition of the varnish, lacquer or enamel.

And while we readily admit that the formulating job is that of the chemist and not one that we should bother the finisher about, yet there is a degree to which finishers should interest themselves in what goes into the product.

I have always maintained that it is not possible for a finisher or an executive to know too much about the ingredients that enter

What Finish?

Pe-Co-Lac Pyroxylin Lacquers

Cuticle Enamel

Rhino-Var Varnishes

Undercoats and Enamels

Reducers for Lacquers

Period Finishes

That question arises out of many widely different problems. Here it is a matter of speed. There the important consideration is color. One manufacturer has to finish for durability, another for striking effects. Costs always have a prominent part in the final determination of finish.

When you get right down to cases, the safest plan always is to have samples submitted to meet your specifications or to undergo tests of your own devising. In lacquers there are divergent opinions as to what constitutes quality. We embody our standards in Pe-Co-Lac and back it with Pecora reputation. Your ideas and requirements can be met by special compounding if necessary.

If you haven't got acquainted with Pe-Co-Lac, tell us how you plan to use a lacquer and let us offer suggestions and samples.

FINISHED WITH PECORA PE-CO-LAC THERE'S NOTHING BETTER

Pecora Paint Company

3rd and Sedgley Streets

Philadelphia, Pa.

Established 1862 *By Smith Bowen*

Incorporated 1911

into a finishing product, and many reliable manufacturers today are really familiarizing their salesmen with the composition of materials, the salesmen in turn giving this information to the man who uses the goods.

Painters buying pure ready-mixed paint almost insist upon the formula being given on the label of the can and leading concerns do this today of their own accord. Why? Because the user is entitled to know what he is getting. Why are not the users of industrial finishing products entitled to know what they are getting just as well as house painters and decorators.

Besides this, a number of large industrial concerns (finish consumers) have established in their factories, testing laboratories where every batch of paint or lacquer that is purchased in put through chemical and physical tests to determine not only the uniformity of each batch but the various physical qualities as well. Some of these concerns specify practically what they want when buying the finished product; whether or not they are going too far in doing this and over-stepping their logical business is a subject well debatable.

In this connection I wish to mention here that synthetic condensation resins, now in use in many lacquer formulas, put out by responsible concerns, are proving to be remarkably effective. This has been proved not only by accelerated weathering tests but also over a period of time under actual elements.

Of course I speak of lacquers properly formulated. It has been my experience to make up formulas using a resin of the glyptal type, rather than the natural gums, to replace all or more of the latter gum, and we obtained a finish that had much body and building qualities, was tougher, and gave a similar finish on wood as can be produced with a varnish. No grayish cast was evident, but that amber color that is so characteristic of a varnish finish was imparted to the surface. In addition, after this finish was rubbed in the usual manner there was gray effect on the surface.

I might state here that I believe there are enough important merits in the use of a lacquer made up from the condensation resin as its larger solid content, to warrant every manufacturer who finishes his product with a high-grade finish, looking into it.

This type of finish has replaced several of the regular type finishes in leading furniture factories throughout the country, and at least some of them looked into the matter very carefully before making the change.

While the cost of producing a lacquer of this type is slightly higher than that of making a standard high-grade material, the small difference is not enough to make much difference to the small or large consumer—and I believe the added improvements obtained by its use will warrant the slight difference in cost.—J. C. H.

Products which are coated with industrial finishes are usually sold throughout the United States, regardless of where they may be manufactured, and it is these sales in widely distributed localities upon which the manufacturer of industrial finishes must ultimately depend for the increased demand for his product.

Constant Uniformity by Agitating Materials *this Way!*

OLD Faithful, Jr., is designed for fast and thorough agitating of liquids, dissolving of solids, or mixing dry powders. Widely used to assure uniform mix in paints, pigmented lacquers or other finishing materials. A twin unit handling containers of any shape ranging from 3 in. to 30 in. in height and from 6 in. to 24 in. in width . . . both chucks and yokes are universal. Automatically tumbles containers end over end and rotates them on their axes at the same time. Patented counter-weight principle eliminates complicated gearing, worms and drive chains. Also suitable for cleaning interiors of containers. Belt or motor drive, ¼ or ½ h. p. motor depending on load . . . maximum load 250 lbs. per yoke.

Larger model (The Senior) handles two drums of 55 to 110 gal. capacity each. Same double action principle makes it ideal for cleaning "empties" or mixing contents of filled drums. Two 25 ft. lengths of special case-hardened cleaning chain furnished with each unit.

Full information on our smaller models for laboratory use will be sent promptly upon request.

Write for literature and details of trial offer.

The VOL-U-METER CO. *Inc.*

Engineers to the Liquid Handling Industry

VUM-41 717 OHIO ST., BUFFALO, N. Y.

Old Faithful Drum Cleaners and Agitators, Vol-U-Meter Drum Filling Device Drum & Barrel Inspection Lamps, Bruno E-Z Kleen Can & Bottle Filling Machines

Fired Porcelain Finishes Produced in Custom Shop

Featuring the equipment and operations employed to produce high-grade vitreous-enamel, color and wood-grained finishes on steel and cast-iron parts in a modern custom shop

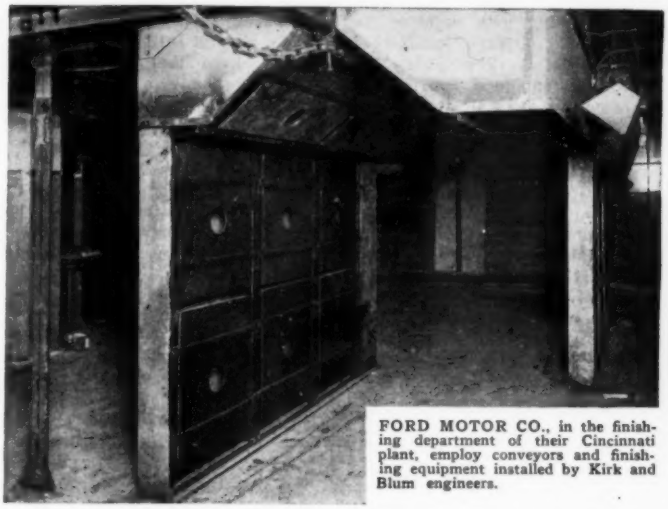
By P. C. Bardin

FROM GROCERY scales to parlor heaters, color is the thing. Through attractive finishes metal products have advanced to hitherto unknown markets and, through this advancement, a new industry has been born—the custom finishing shop where both steel and cast-iron pieces are finished in the many hues of porcelain so much in demand today.

The custom shop of the Louisville Enameled Products Co., at Louisville, Ky., is a representative unit of this new industry. Both the plant and equipment are designed for custom work which includes steel and cast-iron stove and parlor heater parts, scale parts, refrigerator liners, bathroom scales and heaters, imitation tile and mouldings, and electric washing-machine tub shells.

Specialization personified, this shop is like a battleship cleared for action. There is no lost motion, no idle equipment. The plant is housed in a one-story

Top of page: two men at work in one of the double spray booths, each of which is served by conveyor cars operating on a loop track that passes through a continuous drier.



FORD MOTOR CO., in the finishing department of their Cincinnati plant, employ conveyors and finishing equipment installed by Kirk and Blum engineers.

K & B Finishing Equipment

— economical — efficient — speeds production

The application and drying of finishing materials are fast being placed on an efficient production basis through the employment of engineering principles. Kirk and Blum brings to the finishing branch of industry, scientifically designed and well manufactured equipment backed by ample facilities for rendering prompt service.

Typical Kirk & Blum equipment in the automotive industry covers booths, ovens, conveyors and ventilators; similar systems are adapted specifically to furniture and other industries. Special booths and handling equipment are also designed by K & B engineers.

We shall gladly help solve your finishing problems.

THE KIRK & BLUM MFG. CO., 2890 Spring Grove Ave., Cincinnati, Ohio
Detroit Factory and Offices: 4718 Burlingame
Pittsburgh Representative: The Bushnell Mchy. Co., 1501 Grant Bldg.
Louisville Representative: Liberty Blow Pipe Co., Inc., 917 S. 12th St.
Canadian Representative: Canadian-Rogers Ltd., Winnipeg and Toronto

KIRK & BLUM

Industrial Finishing Equipment

brick building with monitor roof and plenty of large windows in outside walls. The floor is of reinforced concrete construction. Two motor-driven air compressors and a small boiler plant, which furnishes heat for the continuous driers, are located in the basement.

The equipment, as illustrated in the accompanying floor plan layout and cuts, is modern and conveniently located. It is designed especially for custom work which includes a great variety of shapes and sizes of steel and cast-iron pieces. In a plant where a definite line of work is finished—for instance, only stove parts—it is possible to entirely separate the steel-parts finishing from the cast-iron finishing.

In such a plant overhead conveyors with suspended hooks may be used for carrying steel parts through the drying ovens and through a continuous furnace. However, this type of equipment is not so well suited to the custom shop where many of the steel parts are odd-shaped, small and not adaptable to being suspended by hooks. Hence, it will be seen by reference to this layout, that from the metal-cleaning rooms, steel and cast-iron parts are finished in the same room, using the same equipment. The finishing process however is different on each class, so I shall describe each one separately.

Finishing Cast Iron Parts

Immediately after being removed from crates, cast-iron pieces are taken to the sandblast room where the surfaces are thoroughly cleaned in a rotary sandblast. After being sandblasted, the castings are blown clean, loaded onto trucks and delivered either to the spray booths—or the loaded trucks may be placed in dry storage while waiting to be

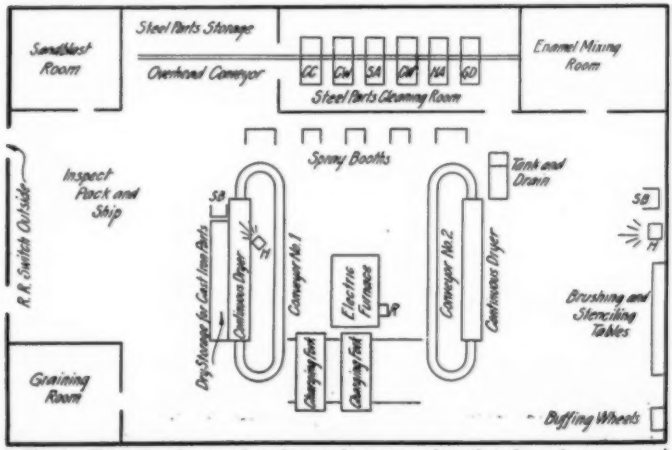


Fig. 1—Floor plan layout of equipment in custom shop that does vitreous enamel finishing on steel and cast-iron parts. In the steel parts cleaning room the lettered rectangles represent: chemical cleaner, cold water, sulphuric acid, cold water, hot alkaline and gas drier pit. Elsewhere each "S.B." indicates a spray booth, while each "H" shows a unit heater.

Industrial FESCO *Finishes*

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Metal Furniture
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Automobiles
Wood Furniture
Pianos—Radio Cabinets
Pumps—Gasoline and Oil
Refrigerators
Machinery
Metallic Grave Vaults
Toys
Miscellaneous

ENAMELS - LACQUERS - VARNISHES
PAINTS

Our Practical Men Always Available

The Ferbert-Schorndorfer Co.
Cleveland, Ohio

finished. Heat from the continuous drier is directed into this storage space to prevent castings from rusting.

The ground coat, generally white in color, is applied at a spray booth. The pieces are then placed on conveyor No. 1, which carries them through the continuous drier where they are dried for 21 minutes at 160° F. As pieces emerge from the continuous drier they are removed from the conveyor and placed on the furnace charging fork*. These forks are so arranged that one may be loaded or unloaded while the other is inside the furnace, therefore the furnace can be operated continuously. The ground coat is fired for 17 to 28 minutes, depending upon the size of the castings.

After being fired, the castings are allowed to cool and are then placed on either conveyor No. 1 or No. 2, depending upon the class of work being finished at that particular time. The spray booths, two of which are double booths where an operator and helper are usually employed spraying small pieces, are located so that both steel and cast-iron pieces may be going through the plant at the same time. In this event, the castings are placed on conveyor No. 1 which carries them to the spray booth where the first color coat is sprayed on.

This coat is then dried in the continuous drier for 21 minutes at 160° F., and fired in the furnace, using the same temperature as required for the ground coat, the time range of 17 to 28 minutes depends upon the size of the castings and the kind of enamel used on this first color coat. Of course, the kind of enamel determines to a great extent the color. Upon removal from the furnace, castings again go through identical operations in which the second color coat is sprayed on, dried and fired, using the same time and temperature as used on the preceding coats.

Castings that require graining (imitiation wood grain) are taken to the graining room where this work is done by the soft-rubber-roll and copper plate method. Grained castings are returned to the furnace to be fired for 18 minutes at 1320° F. The finished castings are then inspected, packed and shipped.

The Process for Steel

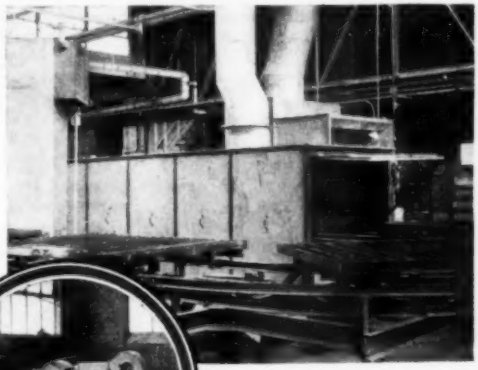
Steel pieces to be finished

* An iron car on which material is loaded and moved into the electric furnace, and on which it remains during the firing operation.

View in the pickling room where steel parts are thoroughly cleaned to prepare the surfaces for finishing

Right: Entrance to continuous drier, with part of conveyor loop and two cars appearing in the foreground. Notice part of unit heater at extreme left, and top of spray booth in background at right.

Insert: Buffers where various coats are removed from steel and iron parts: These wheels are used on some of the stencil work—instead of using hand brushes.



At the dipping tank. Notice unit heater at extreme left

are uncrated and moved to the steel-parts storage space. These parts are then placed in monel metal trays or baskets which are picked up by a traveling electric hoist operated on the overhead trolley. Trays loaded with steel parts are lowered into the hot chemical solution (*CC*, Fig. 1) where they remain from 20 to 40 minutes, depending upon the amount of grease on the surface of the steel. Next they are rinsed in water and then placed in sulphuric acid from 10 to 25 minutes, followed by first a water wash to remove the acid and then a hot alkaline wash to neutralize any remaining traces of the acid. The tray load of steel parts is then lowered into the gas drier pit (GD, Fig. 1) where the parts are thoroughly dried before being loaded on trucks to be delivered to the dipping tanks to receive the ground coat.

When the steel pieces have drained they are placed on conveyor No. 2 and pass through the continuous drier where they are dried for 21 minutes at 160° F. Steel parts are then handled at the electric furnace in a manner similar to the castings.

The ground coat is fired 4 minutes at 1580° F. After cooling, the pieces are placed on conveyor No. 2 and go to the spray booths for the first color coat, after which they are again placed on the conveyor and pass through the continuous drier, the same

time and drying temperature applying for this coat as was used on the ground coat.

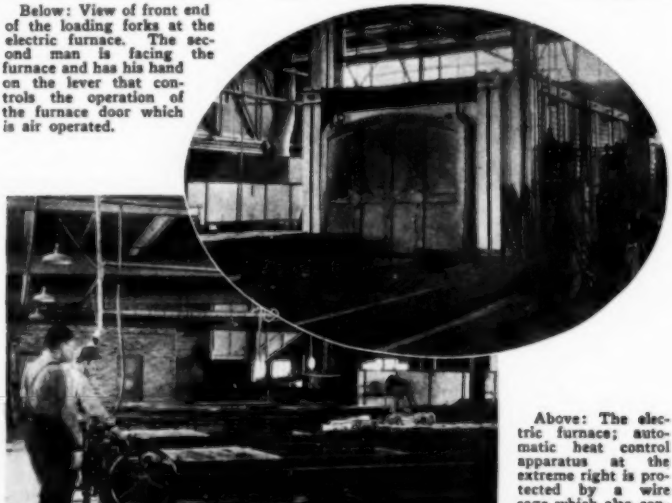
Pieces are then taken to the brushing tables where the first color coat is removed on the edges, corners and around bolt holes, with small bristle hand brushes—this not only for ornamentation but to make the finish more durable. It must be borne in mind that in a vitreous enamel finish, the greater the number of coats applied the less durable the finish will be, especially that surface area which is exposed to excessive service, wear, or pressure in assembling the parts.

After being brushed, the steel parts are fired from 2½ to 3½ minutes at 1520° F., the variation in time depending upon the size of individual pieces and the kind and color of enamel used. Following this baking, steel parts are given the second color coat, going through identical operations, time and temperatures as the first color coat.

Stenciling

Some of the steel pieces, such as scale fronts, oven doors and washing-machine tub shells, require a stenciled name or trademark design. These pieces are generally stenciled just before the second color coat is baked. On those pieces that require sunken letters and design, the solid type of stencil is used, but where the raised design and letters are desired, the open type of stencil is used. I shall briefly explain the process of making and using each type of stencil.

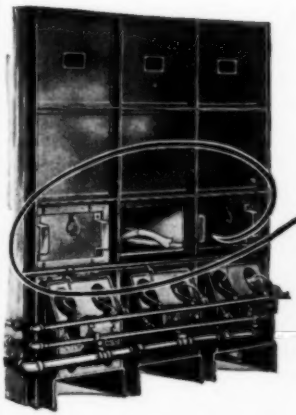
Solid-type stencils are made of either celluloid or of thin glazed

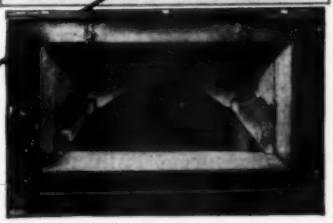


Below: View of front end of the loading forks at the electric furnace. The second man is facing the furnace and has his hand on the lever that controls the operation of the furnace door which is air operated.

Above: The electric furnace; automatic heat control apparatus at the extreme right is protected by a wire cage which also contains a recording instrument on which the furnace temperature is recorded for 24 hour periods.

The Latest Improved NICHOLS OIL GAS FIRED HEATERS embody the convenient





The Nichols Clean-Out door is quickly removed. Affords opening 20" wide by 10" high. Enables operator to brush down and prevent burning out tubes. Avoids necessity for dismantling entire heater. An exclusive Nichols feature that saves time, labor and preserves heater equipment.

Embodied in all new Type "D" Heaters and available for use on your present Nichols Tube Heater.

Our nearest office will gladly give you full installation details and price.

NICHOLS PRODUCTS CORP.

High Temperature Drying and Processing — Industrial Ovens Conveyors — Spray Booths, Air Washers, Dip Tanks

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ARX

Metal Primer

.... for use under lacquers or enamels.

.... bakes in ONE HOUR at 225 degrees Fahrenheit.

....the *toughest*, most adhesive primer ever made.

.... it becomes a part of the metal itself!

(In colors and white)

Pin Coupon to Letterhead

John L. Armitage & Co.

Established 1876

Newark, N. J.

Gentlemen:

Send us details of your A R X Metal Primer as advertised in INDUSTRIAL FINISHING.

cardboard, with the material cut away from the letters or design so that the latter remains solid and surrounded by open space. The solid letters or design are kept in correct position and properly attached to the border or frame by "ties" made of gummed linen tape or adhesive tape cut into strips varying from 1/4 to 3/4-in. wide, depending upon the size of the stencil.

The stenciling job is done on the color-coated surface before the firing operation takes place. It is just the reverse of what ordinarily takes place in a stenciling operation, in that instead of spraying on or brushing on additional material, the operation consists of removing one coat of material where stencil openings expose it. This removal of one coat is possible because the last coat has not been fired (baked), whereas the undercoat or coats are hard from having been fired previous to the application of the last coat.

With the stencil carefully positioned on the surface, the exposed parts of this last color coat are removed by skillful brushing of the steel part, the workman using a small bristle brush. The workman takes off the last color coat wherever it is not protected by the solid portion of the stencil and the stencil "ties." The stencil is then lifted and the "ties," which could not be reached, are carefully brushed out free hand. This leaves the under color coat exposed over the entire surface excepting where the stencil design or letters appear. These stenciled parts are then fired for 1½ to 2½ minutes at 1520° F., the variation in time depending upon the size of the stenciled design or letters.

Open-type stencils are made of

Stripping japan in record time

IN STRIPPING japan from rejected stove parts prior to refinishing, an Ohio concern reports remarkable results. Using an Oakite material, work that formerly required 12 hours is now done *better* in 2 hours.

A marked saving in effort was also effected. Only a light brushing was necessary, and frequently the japan loosened by the Oakite cleaning came off completely in the hot rinse. Such results are typical, not exceptional, when Oakite materials and methods are employed for every industrial finishing cleaning need. Write for particulars. Or ask to have our Service Man call. No obligation in either case.

Manufactured only by

OAKITE PRODUCTS, INC., 32 F THAMES ST., NEW YORK, N. Y.

OAKITE

Industrial Cleaning Materials and Methods

GRAINED METAL

The graining of metal to simulate wood finishes is growing rapidly. Perhaps you too are doing this type of finishing and are dissatisfied with the results obtained with your top coat lacquer.

We have conclusive proof from large manufacturers of automobile moldings, partitions, metal office furniture, trunk racks, etc. that our 303 Gloss and 313 Flat Graining Lacquers are remarkably well suited for this work.

For durability, workability, body and smooth flow over graining inks, we recommend them confidently.

THE Joseph F. Oliddon, FOUNDER AND PRESIDENT, VARNISH PRODUCTS Co

12900 Berea Road

Cleveland, Ohio

The Blue Knight's Column

1929 has been an active year for me, and I won't present myself with the bouquet of promises generally handed out when anybody is making New Year's resolutions . . . about accomplishments and service for the coming year outshining last year's, etc., and so on. . . .

I don't dare promise to better last year's productivity by too wide a margin . . . and be sure of keeping my word! Not when I can look through my files and read some of the letters there about services rendered in 1929 to lacquer users.

But I certainly will promise something!
My research laboratories are not starting the New Year at scratch. They already are on the trail of several new finishing problems. The answers to some of these will break into this column very soon, and I promise they will make interesting, profitable reading!
And then, with enlarged quarters, and an organization geared to hard work, I can surely promise that service this year will continue to be the best we can give . . . and even a little better than that, occasionally, on special demand!

To all my present and future friends, and the entire industry, I wish a Happy and Prosperous New Year!

The Blue Knight

ROXALIN FLEXIBLE LACQUER COMPANY
105 Seventh Avenue,
Long Island City, N. Y.

the same materials but the design or letters are cut out and left open instead of being solid as in solid-type stencils. This type of stencil is used in the same manner as the solid-type stencils just described, the top color coat being removed (before firing) from the design or letters only, leaving the entire remaining surface—which has been protected by the stencil sheet—covered with the last color coat. These parts are baked as usual for 3 minutes at 1520° F.

Other steel parts require decalcomania decoration, this being applied after the final color coat has been fired. After the application of decalcomania the parts are fired for 1½ minutes at 1520° F.

Still other parts, such as the steel outer shells of parlor heaters, require an imitation wood grain. These parts are taken to the graining rooms where the wood grain effect is transferred from copper plates by soft rubber rolls. This graining coat is then baked from 1½ to 2½ minutes at 1520° F.

The Electric Furnace

The electric furnace has its merits and is especially adapted to a custom finishing shop, where both steel and cast-iron pieces are fired in the same furnace and where there is a wide variation in the size and shape of parts and in the class of finishes applied. The electric furnace is very fast, it being possible to raise the temperature inside the furnace at the rate of 40 degrees per minute. This type of furnace produces a uniform heat. With the automatic heat-control device in operation, there is seldom a variation of more than 20 degrees in the furnace, and even this slight fluctuation occurs only when the door is

opened to admit or release charges of material.

Uniformity in temperature and baking time are absolutely essential to high-grade work, for in a vitreous enamel finish there will be a distinct variation in the color of the finished pieces if any over-firing or under-firing occurs. The furnace is equipped with a telechron clock which has an adjustable bell-ringing device that can be set to ring at the expiration of the various baking periods. This type of furnace however is more expensive to operate than either an oil-burning or gas-burning furnace, this particular one consuming 340 k.w. per hour.

This plant produces a very high-grade vitreous enamel finish, the rate of production being 2,500-sq.ft.of steel and 3,000-lbs. of cast iron completely finished per day. Special inspection service is a feature of the work, this applying not only to the finish but, in the case of comparatively thin gauge steel parts, to the shape of each piece after completion of the finishing process. If any sheets or pieces are in the least distorted, due to the excessive baking temperature, these articles are again heated sufficiently to be reformed to their correct shape before packing and shipping.

Finishing Small Turnings

I recommend the following finish for small wood turnings:

For the first coat, dip in enamel and then bake this finish. When the turnings are dry and cool, tumble them in a tumbling barrel. A number of small pieces of hard wax should be added to the turnings in the barrel. This will produce a smooth finish.—Joseph Cowan.

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ENAMELS
Suitable for
Spraying
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Wood
Metal
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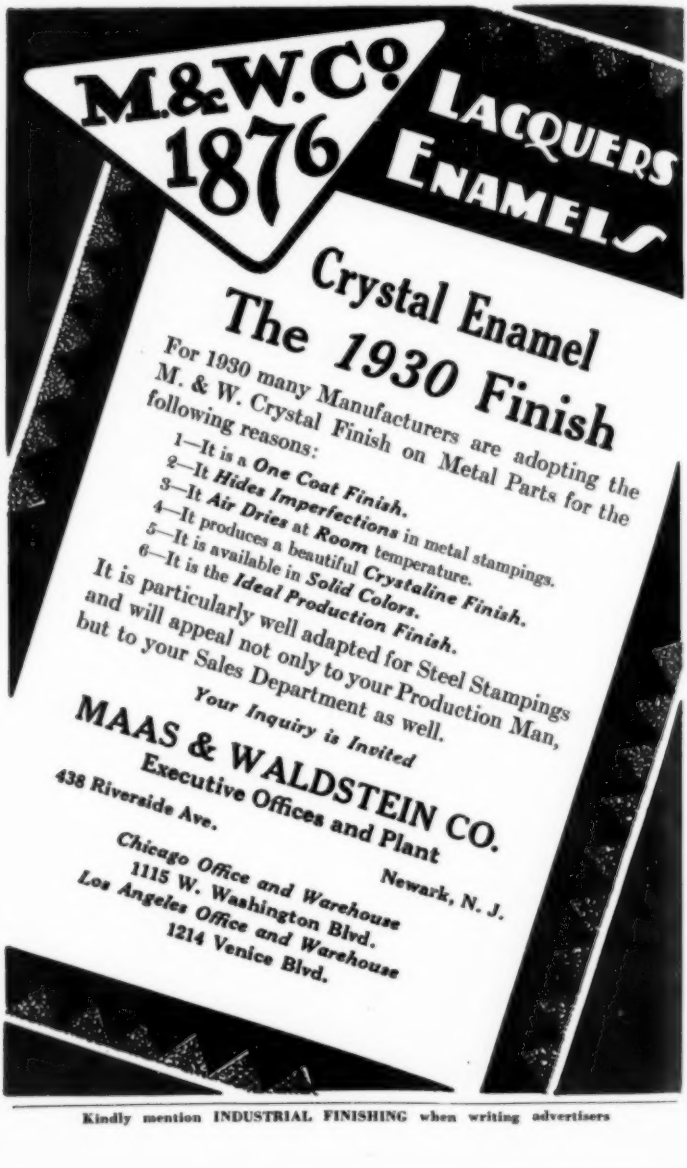
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1876
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Crystal Enamel
The 1930 Finish
For 1930 many Manufacturers are adopting the M. & W. Crystal Finish on Metal Parts for the following reasons:
1—It is a One Coat Finish.
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It is particularly well adapted for Steel Stampings and will appeal not only to your Production Man, but to your Sales Department as well.
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QUESTIONS AND ANSWERS

This service department is conducted to meet the reader's need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Cane Rub for Close Grained Woods

We notice November issue contains an article on page 29, by Mr. D. M. Martin entitled, "Finishing High Grade Store Fixtures," wherein mention is made of a "cane rub" under the paragraphs headed: "Sponging; Sanding; Staining." Will you be kind enough to explain to us what this means?—W. M. D. Co.

Cane rub is similar to sanding, with the substitution of cane shavings (called cane rub) for sandpaper. The results with cane rub are similar to a sanding, with the added advantage of not having "raw" edges and spots which occur when sandpaper is used. This material* is quite inexpensive and the results obtained are most satisfactory.—D. M. Martin.

Silk Screen Stenciling

We have a problem of painting advertising material on lacquer-finished wood display cabinets. We have been informed that the silk screen process is very advantageous for this kind of work. However, we have no information as to who does this type of work and would appreciate any information you can give us along this line. These display cabinets are being made for us by a cabinet company in another city and if you can tell us something about this process, where to obtain materials and where we can find a manufacturer to make the stencil, we believe we can go ahead with this idea.—J. R. C. (Radios).

We understand your problem to be one of printing lettering and display material on lacquer-finished wood display cabinets. The silk screen process is already being used for this purpose by a great many concerns.

On your lacquer-finished cabinets, the use of silk screen lacquer paste would probably be the best. It would adhere perfectly, become part of the lacquer finish itself and present the same appearance. This work could be done by yourselves or your cabinet manufacturer. If you have an artist in your employ you can make your own screen plates, or you can procure them from us ready for use. We cannot quote on a silk screen plate without seeing the sketch or getting an idea of some kind as to the nature of the design, number of colors, size and style of design and lettering, etc. All stencils are made to order and are priced according to each individual design.

For your work—printing on cabinets—if you purchase the screen plate ready made, all that is necessary is for you to place a quantity of paint or lacquer on

*Source of supply on request.

LACQUER IT WITH ZELLAC

AND NOW ZELLAC

"Outdoor Exposure" Grades

Again Zeller achieves what heretofore has been considered impossible! The new Zellac "Outdoor Exposure" Grades provide a finish that is *absolutely impervious to all weather conditions.* Neither summer sun nor winter snows, — rain, wind, brine, sea-fog nor ice, — can break past their amazing resistance. Even our own best lacquer products are now surpassed by the ability of Zellac "Outdoor Exposure" Grades to withstand weather exposure. Their success is without doubt one of the most significant lacquer accomplishments of the century.

Made for spray or dip application, for either a clear high-gloss or clear satin finish, the Zellac "Outdoor Exposure" Grades may be used directly over wood and metal surfaces or as a transparent top coat. And best of all, —*like our Zellac grades* for every industrial purpose,—they can be made to special formula for each customer's requirements. Write for full particulars of our "Outdoor Exposure" Grades,* giving thorough description of your finishing needs.

*We have also the pigmented grades formulated on the same lines, which withstand outdoor exposure conditions equally well.

Zeller Lacquer Mfg. Co., Inc.
20 East 49th Street, New York City

ZELLAC

FOR EVERY INDUSTRIAL PURPOSE

CHICAGO DENVER
LOS ANGELES DALLAS
PORTLAND SEATTLE
WICHITA SAN FRANCISCO

the screen plate—usually sufficient for 75 or 100 impressions. In operation the screen plate is placed on the cabinet to be printed and a squeegee is drawn once across the face of the stencil. It is then removed and shows an exact replica of your original sketch. This is repeated as often as desired; for your class of work, from 150 to 200 impressions per hour would probably be the average. One screen plate, if handled as carefully as any high grade tool, is good for at least 15,000 or 20,000 impressions.—Naz-Dar Co.

White Base for Water Color on Castings

We are endeavoring to locate a white coat for iron castings, which will present a permanently white surface that can be decorated with cheap water colors, washed off and redecorated from time to time —without destroying the permanent undercoat of white. We have tried lacquer enamels, also oil enamels, but on both of these the water color paints do not take in spots, but creep. Some colors take better than others but we have had some difficulty with all of them.—G.I.C.C. (Hardware Specialties & Iron Toys).

I would use a white air-drying undercoat that is semi-porous. This will present a surface on which water paints can be used and on which they will take hold without creeping. This is an oil paint. I am sending you particulars by letter.—M.M.

It seems to me that a China wood oil varnish, made up of about 50% mineral spirits, should be used as a primer for the cast-

ings. Then coat with a material made of lithopone (used as the base white) with about 20% asbestine added. This coat should be worked down flat enough so that the porosity will not be excessive —so that the water color can be easily washed from these minute indentures.—J.B.

Suggests Heat Treatment Before Finishing Cedar

I submit these suggestions on the subject of finishing cedar chests and would like to hear, through the columns of INDUSTRIAL FINISHING, the opinions of brother craftsmen:

After the chests are assembled and smoothed up ready for the finish to be applied, why not place these chests in a hot room for a few hours. Subject them to a temperature of say 90° to 100° F. This temperature is about 15° to 25° F. more than the cabinet may ever be subjected to during its life of usefulness. This heat treatment is to "limber up" the oils, expand the pores of the wood, and cause all the oil to exude or soak into the surface as much as possible.

Then, while we have the chests in this condition, give them a thorough washing with naphtha—as though we were cleaning metal. This treatment is to wash out of the surface pores as much of the surplus oil as possible, cleaning around corners and points carefully while the wood cools off Then, when all naphtha has evaporated, start the finish first with a thin sealer coat of shellac—about 1½ to 2½-lbs. cut to the gallon—followed, when dry and "nib rubbed" or sanded, with a heavy coat (a 2½ to 3-lb. cut) coat of shellac. Let the surface dry

Is Pure Shellac Always Pure?

The percentage of Shellac Gum used is undoubtedly pure, but what about materials such as Rosin and other Alcohol soluble gums?

Why not insist on protection against this form of adulteration? The following warranty is your protection.

"We guarantee the material in this package to be strictly pure Shellac Varnish, composed of Shellac Gum cut four pounds to the gallon in No. 1 Special Denatured Alcohol 190 Proof, and to be free from Rosin, added Wax, excess moisture, dirt, or other adulteration.

Clean as a Hound's Tooth"

If it were possible to make this guarantee stronger we would gladly do it.

Try Strictly Pure Shellac Just Once—You'll Always Use It.

Look for our guarantee label on the package. Prices on request.

Barrett Varnish Company

1532 South 50th Court Cicero, Ill.

This Finish Makes Selling Easier

Modern merchandising makes new and exacting demands on industry. Keen minded customers demand enduring quality—insisting that the beauty they buy shall retain its original luster under the strain of every day use.

To give your product this lasting beauty under the pressure of volume production requires an unusual finish—one that is as modern as these new merchandising demands. That finish will be found in J-W-F products.

Let us show you how J-W-F finishes will meet these new conditions—how they are actually easier to use—faster drying—and more enduring.

A test in your finishing room will be a revelation of how these modern finishes meet industries new demands.

[Jamestown Wood Finishing Co. products are guaranteed. If they will not do for you what we claim for them your money will be refunded.]

Stains — Fillers — Shellacs
Varnishes — Lacquers — Enamels

Jamestown Wood Finishing Company

MAIN OFFICE AND FACTORY
Jamestown - - New York

BRANCHES

Bristol, Conn. Lenoir, N. C.
Milwaukee, Wis. New York City

about 24 hours; then sand and finish with a good grade of cabinet varnish or lacquer.

In other words, I suggest that we try to cause the oils to sweat out or come to the surface, by using more heat than the cabinet will be subjected to in service and in this way get rid of the excess oil with naphtha—and seal remainder with shellac.

I may be wrong in this, but it is a thought that came to me while thinking on the subject. Also, I advise K.P.S., whose inquiry on this subject appears on page 91 of November issue, to remove the old finish with a benzole remover and heat the cabinets in a steam heated room; then, while they are hot, wash them with naphtha. It may be good to bleach the cabinets or chests with some good bleaching solution to get them to their original color for a fresh start. The majority of stain manufacturers can recommend the proper bleaching solution for this.—M. V. Leach.

Decorative Striping

Graceful lines, artistic stripes and curves or circles, when tastefully applied to any manufactured article, enhance its beauty and add distinction and character that creates increased demand and added sales value to any product.

Lacquer, paint, or enamel striping fluids, or any finishing material in one or more colors, appear as inlaid work and will often wear as long as the finished surface that it becomes a part of.

When in finishing trouble, ask the manufacturer of the materials or equipment you use—not his competitor.

NEW MATERIALS AND EQUIPMENT

Presenting briefly, certain outstanding features of new materials and improved equipment which have been developed for use in modern industrial finishing departments

New Metal Finishes

The Columbus Varnish Co., Columbus, Ohio, announces that it has "perfected, in the last six months of 1929, three lines of products especially adapted to metal finishing trade.

"First, a line of lacquer enamels and undercoats with good luster, good covering properties and very durable, used by several of the largest and best known stove manufacturers. Tests have proved superior qualities. . . .

"Second, a line of four to six-hour air-drying colored enamels of extreme brilliancy. This is also used on wood.

"Third, a line of black and colored lacquers and enamels that will stick on chrome, cadmium and stainless steel."

Universal Striper

The Paasche Airbrush Co., 1921 Diversey Parkway, Chicago, announces "a foolproof mechanical tool for doing continuous striping in a vertical or horizontal position with the following exclusive features."

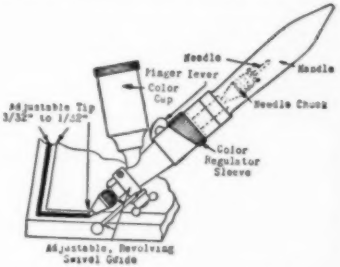
1—Adjustable line tip 1/32 to 3/32-in.

2—Tapered, knurled, adjustable regulator sleeve gives quick and accurate control of color feed.

3—Revolving and adjustable guides.

4—Easy to clean; nothing to get out of order.

The color cups are detachable and an extra pressure color cup may be attached for striping overhead or underneath when it is necessary to force fluid upward to the slotted tip or when heavy colors are used for obtaining a raised or embossed stripe, scroll or decoration. The pressure cup has a screw cover with plunger operated by a spring which continually feeds the color under pressure.



Zeller Announces Outdoor Exposure Lacquer Grades

New lacquer finishing materials of a revolutionizing character have been announced by the Zeller Lacquer Mfg. Co., Inc., 20 East 49th St., New York City. To be known as *Zellac "Outdoor Exposure" Grades*, these lacquers are described by the manufacturer as "absolutely impervious to all weather conditions." Officers of the company state that their

Lacquer Finishes *for* Refrigerators

To manufacturers of cabinets we offer the whitest and most durable lacquer finish at an amazingly low cost per square foot.

• • •

Correct colors and decorations for kitchen use.

• • •

Finishing room service that is worthwhile.

BRADLEY-HURTZ CO.

Successors Industrial Division
Bradley & Vrooman Company
2626 S. Dearborn St.
Chicago, Ill.

ENAMELS LACQUERS INDUSTRIAL PAINTS VARNISHES

weather exposure grades have undergone the most extended and uncompromising tests in practical finishing with complete success, and that consequently these new lacquers have been placed in production to meet a nationwide demand.

Objects of polished brass, where it is desirable to retain a high polish without frequent cleaning, present an illustration of the many articles, to which such weather exposure finishing materials will come as a boon. Other metal products, and many wood products as well, the Zeller officials point out, will be definitely improved by the application of a clear nitrocellulose finish which will withstand the effects of sun, rain, wind, brine, sea-fog, snow or ice for an indefinite length of time. The field for weather exposure grades of lacquer would seem to be almost unlimited.

Announcements of the Zellac "Outdoor Exposure" Grades describe the materials as intended for either a clear high-gloss or clear satin finish when applied directly over wood or metal surfaces. They are made both for spray and dip application, and may be used also as a transparent top coat. A single coat is sufficient for the protection of a polished or any other metal surfaces. For natural wood finishing, the "Outdoor Exposure" Grades may be used according to the customary procedure, following the usual steps of sanding, staining, filling, sealing and wood-lacquering, with a single coat of the new material as an outside top coat.

In discussing the subject of weather exposure lacquers, Mr. Zeller pointed out that the company's laboratory has worked on the problem with a great deal of concentration for several years,

developing improved types step by step. "We perfected the present grades early in 1929," said Mr. Zeller, "and demonstrated their effectiveness to our own satisfaction, both in laboratory and practical tests. However, we have withheld them until now, as it is our custom to give new materials every opportunity in practical finishing demonstrations to show up any possible defects."

Permanent Penetrating Stains

The Chadeloid Chemical Co., 75 E. 45th St., New York City, announces new "Permanent Penetrating Stains," about which Mr. Paul S. Kennedy, Vice President, of the Murphy Varnish Co., (Newark, N. J.) has written a technical paper discussing the merits and performance of the new stains as compared with the other types of wood-finishing stains.

These new "Permanent Penetrating Stains," according to Mr. Kennedy, "have completed their practical testing and perfecting. Several large factories have been using them successfully in production for many months past. Their worth—and the economy possible with them—has been conclusively demonstrated . . . .

"Permanent Penetrating Stain combines all the advantages of these three stains (water, oil and spirit) without their negatives. It has the fast dry of the spirit stain; the excellent penetration of the oil stain, and the fastness to light of the water stain.

"Furthermore, it does not raise the grain; it does not bleed; and it does not leave any non-drying residue.

It's Ready after Three Years Test

MYSTICOTE
Flat Lacquer
#106

Time has been no incentive in the development of this material, for we wanted it to be right before placing it on the market . . . . . wanted it to stand the test of an "absolute guarantee of customer satisfaction, or no pay."

Mysticote No. 106 Flat Lacquer gives a wonderful, smooth, satiny finish far superior to a rubbed effect.

The grain and color of wood are brought out in all their strength and beauty, most desirable qualities in a finished product.

The final result is a flint-like surface.

But the trial offer, mentioned below, affords the opportunity to test Mysticote Flat Lacquer. Give it a trial—that's all we ask.

DONOVAN PRODUCTS COMPANY INC.
ROCHESTER, N.Y.

Send for Five Gal's at the Drum Price at $1.90 Per Gal

MYSTICOTE FLAT CAN BE THINNED UP TO 50%

Building Sales for 1930!

The finish will be more of a sales factor in 1930 than ever before . . . make sure that your products do not lack that distinctive quality characterized by the use of high-grade finishing materials.

Amerilac No. 96 Gloss and No. 97 Rubbed Effect Lacquers, standard with many manufacturers of high-grade furniture and cabinet work, impart finished surfaces that are attractive, and durable as time itself.

Smooth flowing, faster drying, quick sanding—these materials contribute to speedier finishing schedules at lower costs.

Let us tell you how Amerilac Lacquers will fit into your own production schedules.

The American Varnish Co.

High Grade Varnishes, Pyroxylin Finishes, Stains, Fillers and Enamels

1138-1146 N. Branch St., Chicago

"Permanent Penetrating Stains are made from a mixture of liquids which have different boiling points, covering in fact a range of over 250°F. The 'penetrant' liquid and the 'color carrying' liquid are distinctly different. Furthermore, the 'penetrant' liquid is in the lower area of the 'evaporation curve' and the 'color carrying' liquid is at the extreme upper end. This means that the faster evaporating 'penetrants' quickly spread the stain out and drive it into the wood, before any evaporation of the 'color carrying' liquid occurs.

"The measure of the staining efficiency of a stain is the amount of color carried or penetrated to the maximum degree while in a state of complete solution. Conversely, its inefficiency is measured by the amount of color which is precipitated out of solution. The loss is zero in the case of Permanent Penetrating Stains, because the color has been distributed in complete solution to its maximum coverage, before evaporation of the 'color carry' liquid starts.

"In conclusion, further technical possibilities should be hinted at, which are in practical employment —thinning of many paste fillers, using Permanent Penetrating Stains as the reducer, and thus securing a combination filler and stain which is fast to light. And the mixing of Permanent Penetrating Stains with lacquer to get 'fast to light' glaze coats."

Process for Degreasing Metals

A new vapor bath process for the degreasing of metals and other impervious materials, has

WATEROIL No. 1900
RUBBING OIL

A Material Entirely Different and Far Superior to any other Rubbing Vehicle!

Eliminates bloom or bluish cast generally apparent following the usual oil rubbing; white pumice stone traces in hard to get at grooves and corners disappear with Wateroil Rubbing Oil application. Likened to water rubbing but with none of the disadvantages, it gives better results in less time.

Wateroil No. 1900 Rubbing Oil is miscible with water and best results for rubbing are obtained by using five to six parts water to one part oil. Also makes an excellent clean up oil for final cleaning.

Fully Guaranteed — Try It Out!

V. J. DOLAN & COMPANY, Inc.

Wood finishing materials of "Unquestionable Quality"

1830-32 N. LARAMIE AVENUE CHICAGO, ILLINOIS

MIXING TANKS WITH *Hy-Speed* MIXERS

"Hy-Speed" Mixing Tanks are built to mix lacquer . . . varnish ingredients . . . glues . . . colors . . . pastes . . . and other liquid materials.

EXPLOSION-PROOF

The fully-enclosed, vapor-proof motors are safe against all fire hazards in commercial use. Tanks are glass-lined for easy cleaning, and have a handy bottom outlet. Stock sizes 1 to 200 gal.

"*Push-Pull*" PROPELLERS

"Hy-Speed" propeller action mixes top and bottom of the tank at the same time . . . blending colors, etc. in the shortest possible time.

WRITE FOR COMPLETE CATALOGUE

ALSOP ENGINEERING CO

47 West 63rd Street New York City

To Readers Of

Industrial Finishing

This journal is designed especially to suit your particular needs and we want to know what information you desire, what problems or difficulties you have and how we can assist you in your work. It costs you nothing to make inquiries or to tell us what subjects you wish to see discussed in our reading pages.

Many times you have probably felt prompted to write some of your own experiencs, opinions or ideas. Now is your opportunity. INDUSTRIAL FINISHING solicits articles from practical men and pays for all acceptable material.

Kindly express yourself by writing us just what subjects you would like to see covered by articles in the publication; or just what subjects you might write on for publication. Address your communications to

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been developed by the Carrier Engineering Corporation of Newark, N. J., and will shortly be made commercially available.

In this process a solvent known by the Carrier trade name of "Cecolene" is boiled and vaporized. In the standard tank form of the apparatus the vapor rises to the level of water-cooled condenser coils around the side near the top of the tank, is condensed and precipitated to the bottom of the tank. Since the vapor is more than three times as dense as air, there is no tendency to overflow or escape.

Objects to be degreased are suspended in the vapor, which condenses on their cold surfaces at once and runs off profusely, carrying with it all grease. The objects are kept in the vapor until they heat up to its temperature, in from 1½ to 3 minutes, the time depending upon the gauge or weight of the metal or other material. They are then removed in a warm, perfectly dry and clean state, any foreign matter remaining being in the form of dust easily removable.

The articles being degreased do not come into contact with grease previously removed from other material, since the solvent vaporizes at a temperature much lower than the grease, which remains in the liquid below. Economy results from the fact that the chlorinated solvent can be used over and over, the vapor never becoming "dirty."

The Vapor Degreaser is to be made in standard dip tank units and in special designs adaptable to any size or style of continuous conveyor in line assemblies, and to steam, gas or electric heating.

"Cecolene" is a blanket term for a group of chlorinated solvents adaptable to various uses and ma-

SAFETY

in the Finishing Shop . . . . . .

against fumes, dust, fire and other hazards is assured when you adopt PULMOSAN safety devices.

Write us for full information on any of the following items.

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Respirators
Sand Blast Helmets
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Fire Extinguishers
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Simply indicate items interested in, and clip coupon to letterhead.

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SAFETY EQUIPMENT CORP.
174 Johnson St. Brooklyn, N. Y.
Kindly send details of your Safety Equipment recommended for Finishing Shops.

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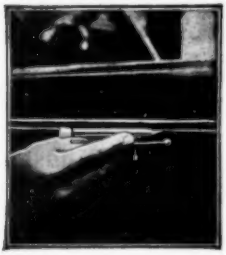
The New Improved Reeves Striper



For that Striping Job!

The Improved Reeves Striping Pencil - - anyone can use it.
Improves and speeds up those striping operations.
Write for sample striping.
Price $10.00, complete with two barrels for narrow and wide stripes. Shipped C.O.D. or on receipt of your check. *Satisfaction Guaranteed.*

E. M. REEVES COMPANY
Flint, Mich.

Crescent Bronze Powder Co.

Importers and Manufacturers

Bronze Powders
Gold and Aluminum Leaf
Bronzing Liquids

We carry all shades of bronze powders for spraying, burnishing and striping.

Samples and prices submitted upon request

116-122 W. Illinois St.
Chicago

terials, and the Carrier research is prepared to supply any needed variation of the formula for a special case.

Obvious uses for this device are in the degreasing of metal stampings, die castings, bolts and nuts, metal furniture, metal lacquerware of many kinds, motor parts, kitchenware, dishes, leather belts, brakebands, articles of glass, Bakelite, celluloid and many other products requiring a cleaning of grease before finishing or packing for distribution.

The Vapor Degreaser was developed in the Carrier experimental laboratories at the Newark plant. It is expected that a separate company will make and market it. The first machine perfected was exhibited at the Power Show. The apparatus is neither complicated nor costly and the Cecolene fluid can be used over and over. By the insertion of diversion condenser plates, the tank can be used for the rectification of Cecolene and other cleaning fluids, also.

Do Paint Specifications Protect Buyers?

(Continued from page 18)

It can be seen that the buyer cannot hope to obtain the intimate secrets of finish manufacturer—to make them part of specifications for his own use and the use of competitors of the finish manufacturer. So what is the next step?

We will assume that the buyer has secured specifications from several manufacturers. He must then study them, assimilate them, condense them, and compare them—and from the consensus of the whole, he works out such specifications as he believes will best fit

ADVERTISING PAGES REMOVED

his operations or his necessities. In order to do this it is necessary that the one compiling the specifications be intimately conversant not only with the manufacture of finishes and the ingredients necessary, but also with the finishing problems of the plant in which he is interested. This adds greatly to the expense, all of which is chargeable to the finishing department, and also to be charged against the occasional losses incurred when not buying according to specifications.

Well and good so far. Now let us assume that specifications for each finish to be used in the plant have been compiled and taken as a standard for future purchases. The next step is to obtain a list of manufacturers—all supposedly reputable and ethical—who will bid on such proposals as the buyer may send out. This is done and a set of proposals are mailed out.

But another thought occurs. Business is not done nowadays wholly on trust. Is it not possible that some finish manufacturer, particularly hungry for business, may bid low enough to secure the purchase order, with the idea in mind that he need not adhere strictly to the specifications; that it may be possible to approximate the specifications or the finish wanted through the use of inferior or cheaper materials? What is to be done? Again it is obvious.

Frequent Tests Necessary

The buyer must either test parts or all of each and every batch of material delivered, by chemical analysis, or he must accept the material as being made in good faith and in accordance with his specifications. Should he do the latter, he is no better off than he was before he put the specifica-

A real finisher that FINISHES!

ECONOMY DeLUXE SPRAYER

Perfectly balanced, non-tiring, strong, serviceable AND light in weight, (2 lbs.).

A real find for the finishing room!

Designed for suction, gravity or pressure feed.

Soft, uniform spray of lacquers, that leaves a beautiful finish.

There are many good reasons for the popularity of ECONOMY Sprayers.

Coupon or letter will bring descriptive literature and prices.

ECONOMY MACHINE PRODUCTS CO., 5214 Lawrence Avenue, (Jefferson Sta.), Chicago, Illinois.

Name .....

Address .....

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Finco

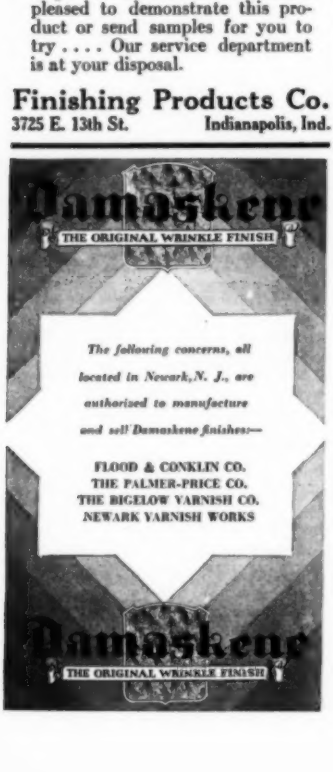
NON - GRAIN RAISING

Water Stain—

requires ***no sanding . . . . . no wash coat*** . . . . saves 24 hours in the finishing room. One furniture manufacturer saves $1.50 on every dining room suite.

Positively fast to light . . . . made only from water aniline colors. Inquiries solicited. We will be pleased to demonstrate this product or send samples for you to try . . . . Our service department is at your disposal.

Finishing Products Co.
3725 E. 13th St. Indianapolis, Ind.


Damaskene
THE ORIGINAL WRINKLE FINISH
The following concerns, all located in Newark, N. J., are authorized to manufacture and sell Damaskene finishes—
FLOOD & CONKLIN CO.
THE PALMER-PRICE CO.
THE BIGELOW VARNISH CO.
NEWARK VARNISH WORKS
Damaskene
THE ORIGINAL WRINKLE FINISH

tions into effect, and he has wasted the expense of compiling such specifications. Hence it is absolutely essential that he have parts of each batch analyzed. He must either install a testing laboratory or, if he already has one, must add to the duties of such department. This also is added expense properly chargeable to the finishing department.

Further, granting that the buyer has compiled and placed into use a set of specifications that are of benefit to him, and that his list of finish manufacturers to receive his proposals is an ethical and worthy list; he sends out his proposals and sits back, confidently expecting to receive bids that are at least closely approximate.

When the bids come in and are tabulated, he has another surprise. For the same product, built up strictly upon his own specifications the prices may range from $1.50 to $3.50 per gallon. He is amazed and his first thought is that the firms submitting the higher prices are adding on a much higher profit than those with the lower bids.

"Ah ha," he says knowingly, "All these years I have been paying so-and-so much more money than I should have paid. They have been making exorbitant profits on my purchases. Well, I have learned something at last."

But has he? It is a well known and assured fact that no two industrial plants making the same product, and operating along closely allied lines of manufacture, will have identical operation costs. It is impossible, for in these days of keen industrial competition one firm may have higher labor costs —more time may be wasted by employes—better buys may be made on raw materials, and a difference in profits may be added

to the production costs. And again, a certain firm may have a reduced production for a time, which forces them to take certain business at a low figure in order to keep their crew of skilled workmen at hand and available until such time as business will be better, when they can operate to greater advantage.

Hence it can be assumed that there will be a difference in the range of prices quoted on materials to be furnished in accordance with definite specifications, even though all proposals are given in good faith. In this way only does the purchaser gain an advantage; he can buy at the lowest figure quoted.

Yet to offset this apparent advantage, if his purchasing department is efficient, that is the way he always has been buying. Different salesmen, quoting prices on materials for a specific purpose which is clearly understood, will also vary in prices, and the purchasing agent can buy where the quotation is lowest. So clearly, nothing is gained.

Wasteful Duplication

This late encroachment (for it is nothing else) upon the different phases of manufacturing by the potential buyer, represents not only a great economic waste but it is an actual waste of his money. If the buyer of industrial finishes could hope to compete with the manufacturer of finishes in the use of chemical and testing laboratories, he would even then be expending sums which would be of no benefit but which would prove an added burden upon his operating costs.

Manufacturers of finishes, with few exceptions, have extensive and well paid staffs of chemists

Send to Watsons for your painting supplies

We carry in stock everything needed in a modern finishing shop. Our merchandise is of the highest quality, listed at moderate prices. Orders are carefully filled and dispatched within twenty-four hours after they are received.

Shoe-Handle Wire Brushes

Our shoe-handle wire brushes cannot be beat for sanding and cleaning purposes. They aremade of round wire.

No.	No. of Rows	Size of Backs	Length Wire
360	4x16	1x5	1¼

Per dozen, $2.50
Each, $.25

Chicago Scrub Brushes
Same style as cut with Black Bristles-4 Row
Per dozen, $4.50 *Each, $.45*
Write for prices in larger quantities.
Prices are net F.O.B. Chicago

Geo. E. Watson Co.
"The Paint People"
164 W. Lake Street Chicago, Ill.

Please send me your new catalog on painters' supplies.

Name .....
Firm.....
Street Address .....
City and State .....
IF1-Gray

Seeing *is* Believing!

ALL Lacquers look alike in the drum . . . . all Lacquers sound alike to buyers!

But spray ALAKA on a few pieces . . see how easily it flows . . how it resists humidity-the cause of blushing . . . . then examine the deep, lustrous durable beauty of the film!

It's easy to test this for yourself. And then change to ALAKA for a prosperous New Year. *Write for Samples.*

LACQUER & CHEMICAL CORP.

214-222 40th ST.-BROOKLYN N.Y

CHICAGO *makers of* ALAKA PHILADELPHIA

DIFFICULT LACQUER PROBLEMS

are being solved satisfactorily with

MAXWEAR

(MAXIMUM WEAR)

INDUSTRIAL LACQUER

HOOSIER PAINT WORKS

FORT WAYNE, IND.

and laboratory workers who have given their lives to the technical study of finishes. It is readily apparent therefore that they have a considerable advantage over any single user who decides to organize a paint-testing laboratory in his own plant, for these trained men must be more conversant with the actual uses and possibilities of industrial finishes than any other firm, without excessive cost. So why duplicate this expense unnecessarily? Why not rather pick out some ethical and trustworthy manufacturer and take his products on trust as being best fitted for certain specific purposes.

Summing up: There is nothing altruistic in business today. Each and every firm engaged in commerce has but the one fundamental idea behind its own existence; that is the gaining of a profit, either small or large, over the expenses of production and operation. Otherwise they would not and could not exist. The executives of every firm have a duty, either to themselves as owners or to their stockholders, to operate in as efficient a manner as possible, and to render to such owners the largest margin of profit compatible with integrity.

To do this it is obligatory upon them to reduce operation costs in every possible way, for every dollar spent in duplication of effort tends to increase expense and decrease profits. So why not let the finish manufacturer bear the expense and burden of the chemical laboratory and testing department, the formulation of finishes, etc., while we as users simply strive to obtain the best finishes available for the purpose intended?

Sales values are finish deep.

Increased Production in Spraying Small Articles

Some time ago it was necessary to finish about 1,000 to 1,600 skids per day for a certain popular-priced chemical refrigerator. The method at the start was to place 50 or 60 skids on a regular standard truck and spray finish them, but when enough skids were supplied it required too many trucks—and the loaded trucks required too much floor space while the finish was drying. The skids were about 3½ or 4-in. high. Really, they could be properly called "short legs."

To avoid using so many trucks I ordered a number of shallow boxes made all the same size. A certain number of the skids were placed on only one standard truck; then these were sprayed and one of the shallow boxes was placed over them to enclose and shield them from spray dust. Then another layer of skids was placed on the box and finished, and another box was placed over them, and so on until all were finished.

This way we used only two trucks and while the first one was being unloaded and reloaded, the second truck load was being sprayed. This idea helped out wonderfully in this case and perhaps it will be helpful to others who may have a similar problem. —M.V.L.

More window shoppers judge your product and form their opinions than the shoppers your salesmen talk with.

Criticisms and fault-finding are often favorite excuses for not buying, so the industrial salesman must make sure that his equipment is being properly used.

Keep Your Spray Booths Clean

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Industrial Finishing

Issued fifteenth of each month. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

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EDITORIAL

Color's Universal Appeal

Some people declare that the world has gone color mad. In reality, however, the world has just gone color sane. A few years ago most people thought black and white were the colors of dignity and good taste. But we of today have stepped out of that age of gloom. We are demanding color in everything we buy, while progressive manufacturers have been quick to grasp this sales builder and, by applying color to their products, have increased both sales and profits.

Manufacturers have found that when they introduce color into their wares they are employing the greatest interest-awakening factor obtainable. The most attractive object in the show windows of a store, whether in the small town or big city, today is something in color; and this applies to everything, whether it is a beautiful little breakfast set done in Spring green, a colored handled kitchen knife or a heating boiler for the basement. Color attracts us and we are at once interested; color has turned the trick. Color makes the whole world kin—peasant and rich alike—all are susceptible to color.

Danger in Paint Drums

Notwithstanding the dictates of common sense, the warnings of insurance companies, safety bulletins and manufacturers of industrial finishes, from time to time one hears or reads of a serious accident caused by the improper use of drums containing finishing materials.

This may be caused by a desire to save or to otherwise make use of the money required to purchase proper spraying equipment, yet the fact remains that more than one firm today is spraying material directly from shipping drums. It would seem that a practice such as this would be so dangerous that no one would do such a thing or instruct others to do it, yet from time to time newspapers and safety bulletins carry reports of such explosions where someone is more or less seriously injured.

A ruling of the Interstate Commerce Commission demands a certain gauge of metal for shipping containers to hold liquids, but naturally there is no ruling as to the pressure per square inch if the container should be used as a receptacle for spraying finishing materials. Evidently the formulators of this ruling did not consider such a practice probable in these enlightened days.

The manufacturer is required by law to stamp on each drum an identifying mark specifying the gauge of the drum in its thinnest part, the date of manufacture and its capacity. A drum marked "S. T.C." is a single trip container according to this ruling and may be made of lighter material.

It is true that many concerns using drums for spraying put on so-called safety devices, but where safety valves, pop-offs, regulators, etc., are effective for the purpose intended by the manufacturer, they are far from effective when mounted on a shipping container made of thin-gauge steel or iron.

Any tank or paint receptacle intended to withstand pressure must be made of far different metal than one intended merely for the conveyance of finishing material. Where the pressure necessary for proper spraying is used, the tank must have sufficient strength to resist explosion in case the safety devices become clogged.

While it is true that the ordinary shipping drum will withstand a pressure of about 10-lbs. per square inch, such low pressure will not give effective spraying power, hence it is the inclination of the sprayer to increase such power, with its attendant danger. Low capacity feed tanks can be secured today from almost any spray equipment manufacturer. These tanks have a pressure resistance of 100-lbs. to the square inch, which practically removes all danger of explosion.

Where Some Finish Troubles Originate, and Why

During the past few years tremendous strides have been made not only in finishing-room equip-

Industrial Products of Quality

cannot be built up—nor finished —with cheap materials.

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ment but in the materials as well. For the best results it is necessary to exercise the greatest care in the selection of the materials. Modern equipment insures profitable production, all other things being equal. Satisfactory work however depends upon more than the mere physical equipment, important though this may be.

Today, beautifully finished products are the rule rather than the exception—witness the fine radio cabinets now on the market, the exquisite furniture, the more durable and artistic metal finishes, etc. However, there still is evidence that many manufacturers lack something in the finishing department. In many instances this is not so much a lack of physicial equipment, as it is the inexperience or slackness on the part of finishing room employes, or the use of inferior finishing materials. It may be both, but most likely cheap and wrong materials will be found at the bottom of much trouble. There is the "nigger in the woodpile."

To emphasize the importance of proper attention to each detail and at the same time to drive home the need for perfect work from the plain, common sense standpoint of profit and loss, let us consider what happens when unsatisfactorily finished work is permitted to leave the plant and reach the consumer. The customer finds fault with the dealer and the dealer comes back on the distributor, and finally the complaint reaches the plant.

Unless the condition is remedied immediately the manufacturer gets a bad name and loses an important distributing outlet; a number of dealers decide there is too much grief with that line and dump it in order to take on

a product made by a competitor. It's a vicious circle. Everyone in a factory organization should appreciate the fact that the lasting beauty of the finish is without question a vital factor in the company's success. This is a slant that is very often lost sight of and at the same time it is the best argument in the world for giving all possible attention to details on which the finish of the product depends.—R. L. Kent.

Why Finish Alligatored

Perhaps some finisher may be interested in an experience I had with a certain shading stain. Trouble: "Crawling." Cause: Applying sealer over filler before proper drying. The sealer was slowed or retarded in its drying and when the shading stain was applied, before contraction of sealer was complete, (since shading stain doesn't have the same power of expansion or contraction as the sealer, or in other words was what is known as "shorter") it cracked, crazed and crawled or alligatored. This was remedied by giving the filler more time to dry.—M.V.L.

Refinishing Artillery

After the surfaces have been cleaned and smoothed, the finish recommended is as follows:

One light coat of metal oxide (oil) primer, followed, when dry, by three coats of oil surfacer, with a drying period of from 8 to 24 hours after each coat. Sand the surfaces smooth and apply three heavy coats of nitrocellulose lacquer of a kind suitable for metal finishing. A generous amount of thinner is used with the lacquer coats.—C. O. Roumen.

The CROWN No. 12 B Gun Pays Its Way In Any Shop!

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POSITION WANTED

As foreman finisher. Have had 20 years' experience. Understand the business thoroughly. Know how to handle help and get production. Best of references as to character and ability from former employers. Address IF-308, care INDUSTRIAL FINISHING.

FOREMAN FINISHER AND DECORATOR

Desires position. Proficient in latest methods of finishing, decorating and economy of production, with background of years of experience. Address IF-310, care INDUSTRIAL FINISHING.

POSITION DESIRED

Young man unusually adept with spray gun, now employed as Superintendent of Finishing Department of large airplane factory, wishes to leave the shop for something more promising. Am a good mixer—both as to paints and people. Have in mind demonstrating to the trade, laboratory work, or combination of both.

I can produce the best work in my line, and want work where honest effort and satisfactory results will be rewarded by advancement and permanent employment. Address IF-309, care INDUSTRIAL FINISHING.

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An experienced man, who knows the application of finishing materials and who can demonstrate his own products, is required.

We prefer a man with some sales experience and following in this territory, and are prepared to credit him with all sales to the Industrial trade in the states of Connecticut, Massachusetts, New Hampshire and Vermont. Applications kept in strict confidence.

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POSITION WANTED

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